There are a couple options for controlling playback of imported video files:

- You can use video behaviors (prewritten ActionScript scripts) to control video playback. See "Controlling video playback using behaviors" on page 176.
- If you are comfortable with ActionScript, you can write your own ActionScript to control video playback. You can play or stop a video, jump to a frame, and control video in other ways. You can also display a live video stream from a camera. See "About controlling video playback using the Timeline" on page 177.

Note: You can preview frames of an imported video by dragging the playhead along the Timeline. However, the sound will not play back. To preview the video with sound, you use the Test Movie command.

You can use the Property inspector and the Embedded Video Properties dialog box to modify embedded and linked video clips. The Property inspector lets you give the clip an instance name; change the width, height, and registration point; and swap a video clip with another video clip. The Embedded Video Properties dialog box lets you rename a video clip, update an imported video that you have edited in an external application, or import another video to replace the selected clip. See "Changing the properties of a video clip" on page 175.

For lessons on working with video, see Import and Edit Video on the Macromedia Flash Support Center at www.macromedia.com/support/flash/images_video/flash_video/.

About file formats for imported video

If you have QuickTime 4 or later (Windows or Macintosh) or DirectX 7 or later (Windows only) installed on your system, you can import embedded video clips in a variety of file formats, including MOV (QuickTime movie), AVI (Audio Video Interleaved file), and MPG/MPEG (Motion Picture Experts Group file). You can import linked video clips in MOV format.

Flash documents with embedded video can be published as SWF files. Flash documents with linked video must be published in QuickTime format.

The following video file formats are supported for importing embedded video if QuickTime 4 is installed (Windows and Macintosh):

File type	Extension
Audio Video Interleaved	.avi
Digital video	.dv
Motion Picture Experts Group	.mpg, .mpeg
QuickTime movie	.mov

The following video file formats are supported for importing embedded video if DirectX 7 or later is installed (Windows only):

File type	Extension
Audio Video Interleaved	.avi
Motion Picture Experts Group	.mpg, .mpeg
Windows Media file	.wmv, .asf

By default, Flash imports and exports video using the Sorenson Spark *codec*. A codec is a compression/decompression algorithm that controls how multimedia files are compressed and decompressed during import and export. For information on the Sorenson Spark codec, see "About the Sorenson Spark codec" on page 165.

If you attempt to import a file format that is not supported on your system, Flash displays a warning message indicating that the operation cannot be completed. In some cases, Flash may be able to import the video but not the audio in a file. For example, audio is not supported in MPG/ MPEG files imported with QuickTime 4. In such cases, Flash displays a warning indicating that the audio portion of the file cannot be imported. You can still import the video without sound.

Note: Imported audio is published or exported as streamed audio, using the global audio streaming settings selected in the Publish Settings dialog box. See "Setting publish options for the Flash SWF file format" on page 282.

About the Sorenson Spark codec

Sorenson Spark is a motion video codec included in Flash that lets you add embedded video content to Flash. Spark is a high-quality video encoder and decoder that dramatically lowers the bandwidth required to deliver video into Flash while simultaneously increasing the video quality. With the inclusion of Spark, Flash takes an important leap forward in video capability. In Flash 5 or earlier, you could only simulate video using sequential bitmap images.

Two versions of Sorenson Spark are available: Sorenson Spark Standard Edition is included in Flash MX 2004 and Flash Player 7. The Spark Standard edition codec produces good-quality video for low-motion content, such as a person speaking. The Spark video codec comprises an encoder and a decoder. The encoder (or compressor) is the component in Spark that compresses your content. The decoder (or decompressor) is the component that decompresses the compressed content so that it can be viewed. The decoder is included in Flash Player.

There are two different types of compression that can be applied to digital media: *spatial* and *temporal*.

Temporal compression identifies the differences between frames and stores only those differences, so that frames are described based on their difference from the preceding frame. Unchanged areas are simply repeated from the previous frame(s). A temporally compressed frame is often referred to as an *interframe*.

Spatial compression, on the other hand, is applied to a single frame of data, independent of any surrounding frames. Spatial compression can be *lossless* (in which no data is discarded from the image) or *lossy* (in which data is selectively discarded). A spatially compressed frame is often referred to as an *intraframe*.

Sorenson Spark is an interframe codec. Sorenson Spark's efficient interframe compression, among other features, distinguishes it from other compression technologies, requiring a much lower data rate than most other codecs to produce good-quality video. Many other codecs use intraframe compression; for example, JPEG is an intraframe codec.

However, interframe codecs also use intraframes. The intraframes are used as the reference frames (keyframes) for the interframes. Sorenson Spark always begins with a keyframe. Each keyframe becomes the main reference frame for the following interframes. Whenever the next frame is significantly different from the previous frame, the codec compresses a new keyframe.

Tips for creating Flash video with Sorenson Spark

How you compress your video is largely determined by the content of the video. A video clip of a talking head with very little action and only short bursts of moderate motion compresses very differently than footage of a soccer match does. Following are some tips on delivering the best possible Flash video:

Strive for simplicity Avoid elaborate transitions—they don't compress well and may make your final compressed video look "chunky" during the change. Hard cuts are usually best, or quick cross-fades. Video sequences that show an object zooming from behind the first track, doing a "page turn," or wrapping around a ball and then flying off the screen may be eye-catching, but they usually don't compress well and should be used sparingly.

Know your audience data rate When you deliver video over the Internet, you should produce files at lower data rates. Users with fast Internet connections can view the files with little or no wait, but dialup users have to wait for the files to download. It is best to make the clips short to keep the download times within acceptable limits for dialup users.

Select the proper frame rate Frame rate indicates how many frames are played each second. If you have a higher data rate clip, a lower frame rate can improve playback on lower-end computers. For example, if you are compressing a talking head clip with little motion, cutting the frame rate in half will probably save you only 20% of the data rate. However, if you are compressing high-motion video, reducing the frame rate has a much greater effect on the data rate.

Because video looks much better at native frame rates, Macromedia recommends leaving it high if your delivery channels and playback platforms allow. However, if you need to reduce the frame rate, the best results come from dividing the frame rate by whole numbers.

Select a frame size that fits your data rate Like the frame rate, the frame size for your document is important for producing high-quality video. At a given data rate (connection speed), increasing the frame size results in decreased video quality. When you select the frame size for your document, you must also consider frame rate, source material, and personal preferences. The following list of common frame sizes should be used as a guideline. Experiment to find the best setting for your project.

Modem: 160 x 120

Dual ISDN: 192 x 144

T1/DSL/cable: 320 x 240

Know progressive download You should know how long it is going to take to download your video. While your video clip is downloading, you might want to have other content that appears and "disguises" the download. For short clips you can use the following formula: Pause = download time – play time + 10% of play time. For example, If your clip is 30 seconds long and it takes one minute to download, you should give your clip a 33-second buffer: 60 seconds – 30 seconds + 3 seconds = 33 seconds.

Use clean video The higher the quality of the original, the better the final result. Although frame rates and sizes of Internet video are usually smaller than those of television, computer monitors have much better color fidelity, saturation, sharpness, and resolution than conventional televisions. Even with a small window, image quality can be more important for digital video than for standard analog television. Artifacts and noise that would hardly be noticeable on TV can be painfully obvious on a computer.

Remove noise and interlace   After you capture your video content, you might need to remove noise and interlace.

Follow the same guidelines for audio   The same considerations exist for audio production as for video production. To achieve good audio compression, you must begin with clean audio. If you are encoding material from a CD, try to record the file using direct digital transfer instead of through the analog input of your sound card. The sound card introduces an unnecessary digital-to-analog and analog-to-digital conversion that can create noise in your source audio. Direct digital transfer tools are available for both Windows and Macintosh platforms. If you must record from an analog source, be sure to use the highest quality sound card available.

Using the Video Import wizard

The Video Import wizard provides a streamlined interface for importing video into a Flash document. The wizard lets you choose whether to import a video clip as an embedded or a linked file.

When you import a video clip as an embedded file, you choose options in the wizard for encoding and editing the video. Click the Next button to advance through panes in the wizard, and click the Back button to return to previous panes.

You can import video clips as embedded files in a variety of file formats, depending on your system. For information on supported file formats, see "About file formats for imported video" on page 164. You can preview frames of an imported video by dragging the playhead along the Timeline. However, the sound will not play back. To preview the video with sound, use the Test Movie command. See "Testing document download performance" on page 38

When you import a video as an embedded file, you have the option to edit the video before importing it. You can also apply customized compression settings, including bandwidth or quality settings, as well as advanced settings for color correction, cropping, and other options. You choose editing and encoding options in the Video Import wizard. After a video clip is imported, it cannot be edited.

Embedded video is encoded using the Sorenson Spark codec. See "About the Sorenson Spark codec" on page 165.

Using the Property inspector, you can give an embedded clip an instance name; change its width, height, and position on the Stage; and swap the embedded clip with another video clip. You can use the Embedded Video Properties dialog box to rename a video clip, update an imported video clip that you have edited in an external application, or import another video to replace the selected clip. See "Changing the properties of a video clip" on page 175.

You can export an embedded video as a Macromedia Flash Video (FLV) file, which retains the compression settings applied when the FLV file was created. See "Macromedia Flash Video (FLV)" on page 315.

For lessons on working with video, see Help > How Do I > Quick Tasks > Create a Document or Import and Edit Video.

To import an embedded video clip:

1 Do one of the following:

   ■ To import the video clip directly to the Stage in the current Flash document, select File > Import > Import to Stage.

   ■ To import the video clip into the library for the current Flash document, select File > Import > Import to Library.

2 Do one of the following:

   ■ To import the entire video clip without editing it, select Import the Entire Video. Click Next. Proceed to step 3 to continue selecting compression options for the video.

   ■ To edit the video clip before importing it, select Edit the Video First. Click Next. To select editing options for the video, see the instructions under "Editing video clips in the Video Import wizard" on page 168.

3 Do one of the following:

   ■ To apply a predefined Compression Profile, select a Bandwidth option from the pop-up menu.

   ■ To create a custom compression profile, select Create New Profile or a predefined compression rate from the Compression profile pop-up menu and click Edit. For more information, see "Editing video clips in the Video Import wizard" on page 168.

4 To apply advanced video encoding to specify color, dimensions, track, and audio options, select Create New Profile from the Advanced Settings pop-up menu. For more information, see "Selecting advanced settings in the Video Import wizard" on page 171.

5 Click Finish to close the Video Import wizard and complete the video import procedure.

To update an embedded video clip after editing it in an external editor:

1 Select the video clip in the Library panel.

2 In the options menu in the upper right corner of the Library panel, select Properties.

3 In the Embedded Video Properties dialog box, click Update.

   The embedded video clip is updated with the edited file. The compression settings you chose when you first imported the video are reapplied to the updated clip.

Editing video clips in the Video Import wizard

The Video Import wizard provides editing options that let you edit embedded video as you import it. You can select in and out points for a clip, create multiple clips from one imported clip, and select other editing options. Editing as you import video clips is especially useful with raw footage.

To edit an embedded video clip:

1 Import an embedded video clip.

2 Select Edit the Video First and click Next to open the Editing pane of the Video Import wizard.

3 To browse frames in the video, do one of the following:

- Drag the playhead along the scrubber bar.
- Click the Play button to move forward and the Pause button to stop at the desired frame.
- Click the Backward and Forward buttons in the Controller to move forward or backward one frame at a time.

4 To set the in and out points (beginning and ending frames), do one of the following:

- Drag the in and out points (the triangles below the scrubber bar).
- Click the In or Out button in the button controls below the scrubber bar to set the beginning or ending frame at the current location of the playhead.

5 To play the video, do one of the following:

- Click the Play button in the button controls to play the video from the current playhead position.
- Click Preview to play the video with the current in and out points.

   Note: Click the Stop button in the button controls to stop video playback.

6 To create a clip with the current in and out points, click Create Clip. The clip appears in the scroll pane at the left of the Editing pane.

   To create additional clips from the same file, select in and out points for the clips as described in step 4, and click Create Clip again.

7 To rename a clip, select it in the scroll pane and enter the new name.

8 To re-edit a clip, select it in the scroll pane. Select new in and out points as described in step 4, and click Update Clip.

9 To combine all clips in the scroll pane into a single clip for import, select Combine List of Clips into a Single Library Item After Import.

10 To change the order of clips in the scroll pane, select a clip in the scroll pane and click the Up Arrow or Down Arrow button.

   Note: The order of clips in the scroll pane is the order in which clips will be appear if you combine them into a single clip for import.

11 To delete a clip from the scroll pane, select the clip and click the Delete (-) button.

12 When you have completed the editing process, click Next to advance to the next pane in the Video Import wizard.

Selecting compression profiles in the Video Import wizard

The Video Import wizard provides a range of options for compressing a video clip during the import process. In the Encoding panel, you can enter a value for Bandwidth or Quality, control the frequency of keyframes, ensure consistent image quality in keyframes, increase encoding speed, and match the playback speed of the imported video to the playback speed of the main Flash document Timeline.

You select a compression profile to choose the level of compression that will be applied to the imported embedded video. You can select a profile based on bandwidth or video quality.

- Custom bandwidth options range from 0 Kbps to 750 Kbps and specify the approximate download speed, in kilobits per second, for the video. Preset options include 56 Kbps modem, 256Kbps, and 512 Kbps, and 786 Kbps on DSL or cable. The quality setting of individual frames may vary, in order to achieve a consistent download speed.

- Video quality settings, which range from 0 to 100, specify a compression level for all frames. You can also specify a keyframe rate. The download speed may vary in order to achieve a consistent compression level.

To reduce the time it takes to compress a file, you can select Quick Compress.

You can synchronize the frame rate of an embedded video to match the frame rate of the main Timeline. You can also adjust the ratio of the video frame rate to the main Timeline frame rate, to drop frames from the imported video during playback.

In some situations, you may not want to synchronize the embedded video with the SFW file. Instead, you want to prevent frames in the embedded video from being dropped or duplicated. For example, suppose you want to import an NTSC video clip with a frame rate of 29.97 frames per second (fps) into a Flash document with a frame rate of 30 fps. Deselecting the Synchronize option keeps frames from being dropped in the embedded video and prevents the hiccup effect that this causes during playback.

You can save customized compression profiles as named settings. The new settings appear in the Compression Profile pop-up menu.

To create a custom compression profile:

1 From the Compression Profile pop-up menu in the Encoding panel, select Create New Profile or a predefined compression rate and then click Edit.

2 Do one of the following:
   - Select Bandwidth and drag the slider or enter a Bandwidth value between 0 and 750 Kbps. Bandwidth options specify the approximate download speed, in kilobits per second, for the video. The quality setting of individual frames may vary, in order to achieve a consistent download speed.
   - Select Quality and drag the slider or enter a quality value between 0 and 100. Quality options specify a compression level for all frames. Higher values yield better images but increase download time. The download speed may vary in order to achieve a consistent compression level.

3 Drag the slider or enter a value for Keyframe Interval to control the frequency of keyframes (frames with complete data) in the video clip. For example, with a keyframe interval of 30, Flash stores a complete frame every 30 frames. For frames between intervals, Flash stores only the data that changes from the preceding frame. With smaller intervals, you can fast-forward or rewind more quickly to a specific frame, but file size is larger.

   Note: A keyframe interval of 1 stores a complete frame for each frame of the video. This setting is recommended only for very small video files.

4 If you are encoding the video using a bandwidth value, select High Quality Keyframes to ensure consistent image quality in keyframes. Using a consistent bandwidth speed can reduce the quality of keyframes if you do not select this option.

5 Select Quick Compress to reduce the time it takes to compress a file. Increasing encoding speed may also decrease image quality.

6   Select Synchronize Video to Macromedia Flash Document Frame Rate to match the playback speed of the imported video to the playback speed of the main Flash document Timeline. Deselect this option to prevent frame rate synchronization.

7   Select a value for Number of Video Frames to Encode Per Number of Flash Frames to specify the ratio of imported video frames to main Flash Timeline frames. For example, to play one imported video frame for every main Flash Timeline frame, select 1:1; to play one imported video frame for every two main Timeline frames, select 1:2.

Dropping frames from the imported video does not slow down the motion of the video. Instead, it displays fewer frames per second, so that the video appears more choppy in playback.

8   Click Next.

9   Enter a name and description on the Encoding (Part 3, Save) panel. Click Next to save the setting.

10 Do one of the following:

- Edit the Advanced settings.
- Click Finish.

11 If you chose Current Timeline or Graphic Symbol for Track Options, a notification appears if the imported clip contains more frames than the current Timeline. Do one of the following:

- Click Yes to add the required number of frames to the current Timeline span.
- Click No to keep the span at its current size. Frames in the imported clip that exceed the frames in the span are not displayed unless you subsequently add frames to the span.

Selecting advanced settings in the Video Import wizard

In the Video Import wizard, you can apply advanced settings to imported videos. Color-correction options let you adjust hue, saturation, brightness, contrast, and gamma to control color quality. Dimensions options let you reduce the scale of the imported video, or crop the video from the top, bottom, left, or right edge.

Track options let you choose what type of object the imported video will be: a video object on the current Timeline, a movie clip on the first frame of the Flash document, or a graphic symbol on the current Timeline. Audio options let you import an audio track as a separate file or an integrated part of the video file, or let you exclude the audio track from the imports.

You can save customized advanced settings as named profiles. The new settings appear in the Advanced Settings pop-up menu.

To apply advanced video encoding settings:

1   In the Video Import wizard, after you have specified options for Compression Profile, select Create New Profile from the Advanced Settings pop-up menu. (If you have previously created Advanced Settings profiles, you can select a named setting from the pop-up menu.)

2   Under Color options, enter values or drag the pop-up sliders to apply color corrections to the video image:

Hue measures the color value, commonly indicated by the color name, such as red or green. Hue is identified as a location on a standard color wheel. Hue value can be between -180° and 180°.

Saturation measures the strength or purity of the color. Saturation measures the amount of gray in proportion to the hue, indicated as a percentage between -100 and +100. A smaller saturation value indicates more gray. A higher value adds more color.

Brightness measures the relative lightness or darkness of the color, indicated by a percentage between -100 and +100. A smaller value indicates more black, and a larger value indicates more white.

Contrast measures the contrast between dark and light in the image, indicated by a percentage value between -100 and +100. A smaller value indicates less contrast.

Gamma measures the overall lightness levels, indicated by a value between 0.1 and 1.8. A smaller value indicates a darker image. With a larger value, dark elements in the image stay dark and light elements become lighter.

Reset resets all Color options to their default values.

3   Under Dimensions options, enter values or drag the pop-up sliders to adjust the video dimensions:

■   For Scale, enter a value between 0 and 100 to decrease the scale of the video. The Width and Height values indicate the size of the video in pixels. (You cannot increase the scale of the video beyond its original size.)

■   For Crop, enter values for the right, left, top, and bottom edges to crop the video. Guides in the preview window indicate where the cropping will occur.

4   Under Track options, select an option for Import Into to specify what type of object the imported video will be:

Current Timeline imports the video as a video object in the current Timeline in the Flash document. If there are not enough frames in the current Timeline to accommodate the video, Flash prompts you to add more frames on import. With this option, you can browse the video frames in the current Timeline. However, you cannot apply effects to the video object.

Movie Clip imports the video as a movie clip in the first frame of the Flash document. With this option, you can apply effects. However, you cannot browse the video frames in the current Timeline. (To browse the frames, you must open the Timeline of the movie clip.)

Graphic Symbol imports the video as a graphic symbol in the current Timeline. If there are not enough frames in the current Timeline to accommodate the video, Flash prompts you to add more frames on import. With this option, you can browse the video frames in the current Timeline, and you can apply effects to the video.

5   For Audio Track, select an option to specify how audio will be imported:

Separate imports the audio track as a sound object, separate from the video file.

Integrated imports the audio track as part of the video file.

None does not import the audio track.

6   Click Next.

7   Enter a name and description for the Advanced Settings to save the settings. The name appears in the Advanced Settings pop-up menu the next time you use the Video Import wizard. Click Next.

8   Click Finish to close the Video Import wizard and import the video.

9   If you chose Current Timeline or Graphic Symbol for Track Options, a notification appears if the imported clip contains more frames than the current Timeline. Do one of the following:

   ■ Click Yes to add the required number of frames to the current Timeline span.

   ■ Click No to keep the span at its current size. Frames in the imported clip that exceed the frames in the span are not displayed unless you subsequently add frames to the span.

Importing Macromedia Flash Video (FLV) files

The Macromedia Flash Video (FLV) file format lets you import or export a static video stream with encoded audio. This format can be used with communications applications, such as video conferencing.

Files in the FLV format are compressed with the Sorensen codec. See "About the Sorenson Spark codec" on page 165.

You can import files in the FLV format using the Import or Import to Library commands or the Import button in the Embedded Video Properties dialog box.

To import a video clip in FLV format, do one of the following:

• Select File > Import or File > Import to Library.

• Select any existing video clip in the Library panel and select Properties from the Library options menu. In the Embedded Video Properties dialog box, click Import. Locate the file you want to import and click Open in the Open dialog box.

Importing linked QuickTime video files

If you are importing a QuickTime video clip, you can link to the video from the Flash file, rather than embed the video. A linked QuickTime movie imported into Flash does not become part of the Flash file. Instead, Flash maintains a pointer to the source file.

If you link to a QuickTime video, you must publish the SFW file as a QuickTime movie. You cannot display a linked QuickTime in SWF format. The QuickTime contains a Flash track, but the linked video clip remains in QuickTime format.

For more information on publishing your Flash file as a QuickTime movie, see "Specifying publish settings for QuickTime movies" on page 293.

You can scale, rotate, and animate a linked QuickTime movie in Flash. However, you cannot tween linked QuickTime movie content in Flash.

Note: The QuickTime Player does not currently support Flash Player 6 files. For more information. see ""Specifying publish settings for QuickTime movies" on page 293.

To import a QuickTime video as a linked file:

1 Do one of the following:

   ■ To link the video clip directly to the current Flash document, select File > Import > Import to Stage.

   ■ To link the video clip to the library for the current Flash document, select File > Import > Import to Library.

2 In the Import Video wizard, select Link to External Video File. Click Next.

3 If you imported the video clip directly to the Stage in step 1, a warning appears if the imported clip contains more frames than the span in which you are placing it in the current Flash document. Do one of the following:

   ■ Click Yes to extend the span the required number of frames.

   ■ Click No to keep the span at its current size. Frames in the imported clip that exceed the frames in the span are not displayed unless you subsequently add frames to the span.

You can preview a linked QuickTime movie before you publish your SWF file. When you import a linked QuickTime movie, Flash adds the required number of frames to preview the QuickTime movie, just as it does for an embedded video.

Note: You cannot preview linked QuickTime movie content using the Test Movie command.

To preview a linked QuickTime movie:

• Select Control > Play.

Setting the directory path of a linked QuickTime movie

You can set the directory path of a linked QuickTime video clip in the library for the current Flash document.

To set the directory path of a linked QuickTime video clip:

1 Select Window > Library and select the linked QuickTime movie you want to edit.

2 In the options menu in the upper right corner of the Library panel, select Properties.

3 Click Set Path in the Linked Video Properties dialog box.

4 In the Open dialog box, navigate to the file for the linked video clip and select it, then click Open.

5 In the Linked Video Properties dialog box, click OK.

About playing back external FLV files dynamically

As an alternative to importing video into the Flash authoring environment, you can use ActionScript to dynamically play back external FLV files in Flash Player. You can play back FLV files posted as HTTP downloads or as local media files. To play back FLV files, you use the NetStream object and the attachVideo method of the Video object.

You can create FLV files by importing video into the Flash authoring tool and exporting it as an FLV file. For information on exporting video as an FLV file, see "Macromedia Flash Video (FLV)" on page 315. If you have Macromedia Flash MX Professional 2004, you can use the FLV Export plug-in to export FLV files from supported video-editing applications. See "Exporting FLV files from video-editing applications (Flash Professional only)" on page 178.

To play back an external FLV file, you must post an FLV file to a URL (either an http site or a local folder) and add ActionScript code to the Flash document to access the file and control playback during runtime.

Using external FLV files provides certain capabilities that are not available when using imported video:

- You can use longer video clips in your Flash documents without slowing down playback. External FLV files are played using *cached memory*. This means that large files are stored in small pieces and accessed dynamically, and do not require as much memory as embedded video files.

- An external FLV file can have a different frame rate from the Flash document in which it plays. For example, you can set the Flash document frame rate to 30 fps and the video frame rate to 21 fps. This allows you greater control in ensuring smooth video playback.

- With external FLV files, Flash document playback does not have to be interrupted while the video file is loading. Imported video files may sometimes interrupt document playback to perform certain functions for example, to access a CD-ROM drive. FLV files can perform functions independently of the Flash document, and so do not interrupt playback.

- Captioning of video content is easier with external FLV files, because you can use callback functions to access metadata for the video.

For more information on playing back FLV files, see "Playing back external FLV files dynamically" in ActionScript Reference Guide Help.

Changing the properties of a video clip

You can use the Property inspector to change properties for an instance of an embedded or linked video clip on the Stage. In the Property inspector, you can assign the instance an instance name and change its width, height, and position on the Stage. You can also *swap* an instance of a video clip—assign a different symbol to an instance of a video clip. Assigning a different symbol to an instance displays a different instance on the Stage but leaves all the other instance properties (such as dimensions and registration point) intact.

The Embedded Video Properties dialog box allows you to view information about an imported video clip, including its name, path, creation date, pixel dimensions, length, and file size. You can change the video clip name, update the video clip if you modify it in an external editor, and import an FLV video to replace the selected clip.

Note: You can also export a video clip as an FLV file using the Embedded Video Properties dialog box. See "Macromedia Flash Video (FLV)" on page 315.

To change video instance properties in the Property inspector:

1 Select an instance of an embedded or linked video clip on the Stage.

2 Select Window > Properties.

3 In the Property inspector, do any of the following:

- Enter an instance name in the name text box at the left side of the Property inspector.

- Enter values for W and H to change the dimensions of the video instance.

- Enter values for X and Y to change the position of the upper left corner of the instance on the Stage.

- Click Swap. In the Swap Embedded Video dialog box, select a video clip to replace the one currently assigned to the instance.

  Note: You can swap an embedded video clip only with another embedded video clip, and you can swap a linked video clip only with another linked video clip.

To view video clip properties in the Embedded Video Properties dialog box:

1 Select a video clip in the Library panel.

2 Select Properties from the Library options menu.

To assign a new name to a video clip:

1 Select the video clip in the Library panel.

2 Select Properties from the Library options menu.

3 In the Embedded Video Properties dialog box, enter a new name in the Name text box.

To update a video clip:

1 Select the video clip in the Library panel.

2 Select Properties from the Library options menu.

3 In the Embedded Video Properties dialog box, click Update.

4 Navigate to the updated video file and click Open. The file is reimported into the Flash document.

To replace a video clip with an FLV clip:

1 Select the video clip in the Library panel.

2 Select Properties from the Library options menu.

3 In the Embedded Video Properties dialog box, click Import.

4 Navigate to the FLV file that will replace the current clip, and click Open.

Controlling video playback using behaviors

Video behaviors provide one way to control video playback. Behaviors are prewritten ActionScript scripts that you add to an object, such as a video clip, to control that object. Behaviors allow you to add the power, control, and flexibility of ActionScript coding to your document without having to create the ActionScript code yourself. Video behaviors let you play, stop, pause, rewind, fast-forward, show, and hide a video clip.

To control a video clip with a behavior, you use the Behaviors panel to apply the behavior to a triggering object, such as a button. You specify the event that will trigger the behavior (such as releasing the button), select a target object (the video that will be affected by the behavior), and when necessary, select settings for the behavior, such as the number of frames to rewind.

The following behaviors are packaged with Flash MX 2004 and Flash MX Professional 2004 and are used to control embedded video.

Behavior	Purpose	Parameters
Play Video	Plays a video in the current document.	Instance name of target video
Stop Video	Stops the video.	Instance name of target video
Pause Video	Pauses the video.	Instance name of target video
Rewind Video	Rewinds the video by the number of frames specified.	Instance name of target video Number of frames
Fast Forward Video	Fast-forwards the video by the number of frames specified.	Instance name of target video Number of frames
Hide Video	Hides the video.	Instance name of target video
Show Video	Shows the video.	Instance name of target video

For lessons on working with video, select Help > How Do I > Quick Tasks > Create a Document or Import and Edit Video.

To add and configure a behavior:

1 Select the object, such as a button, that will trigger the behavior.

2 In the Behaviors panel (Window > Development Panels > Behaviors), click the Add (+) button and select the desired behavior from the Embedded Video submenu.

3 In the dialog box that appears, select the video you want to control with the behavior.

4 Select a Relative or Absolute path. For more information, see "Using absolute and relative target paths" on page 20.

5 If required, select settings for the behavior parameters and click OK.

Default event and actions for the behavior appear in the Behaviors panel.

6 Under Event, click On Release (the default event) and select a mouse event from the menu. If you want to use the On Release event, leave the option unchanged.

About controlling video playback using the Timeline

You can control playback of an embedded or linked video file by controlling the Timeline that contains the video. For example, to pause a video playing on the main Timeline, you would call a stop() action that targets that Timeline. Similarly, you can control a video object in a movie clip symbol by controlling the playback of that symbol's Timeline.

You can apply the following actions to imported video objects in movie clips: goTo, play, stop, toggleHighQuality, stopAllSounds, getURL, FScommand, loadMovie, unloadMovie, ifFrameLoaded, and onMouseEvent. To apply actions to a Video object, you must first convert the Video object to a movie clip. For more information, see "Video class" in ActionScript Reference Guide Help.

You can also use ActionScript to display a live video stream from a camera. First, use the New Video Object in the Library panel to place a Video object on the Stage. Then use `Video.attachVideo` to attach the video stream to the Video object. For more information, see `Video.attachVideo()` in ActionScript Dictionary Help.

Exporting FLV files from video-editing applications (Flash Professional only)

If you have Macromedia Flash MX Professional 2004 and QuickTime 6.1.1 installed on your system, you can use the FLV Export plug-in to export FLV files from supported video-editing applications. You can then import these FLV files directly into Flash for use in your Flash documents. In addition, you can dynamically play back external FLV files in Flash documents at runtime. See "About playing back external FLV files dynamically" on page 174.

Exporting FLV files from video-editing applications significantly streamlines the workflow in using FLV files in your Flash documents. With the FLV Export plug-in, you can select encoding options for video and audio content as you export, including frame rate, bit rate, quality, and other options. Then you can import FLV files directly into Flash without needing to re-encode the video after import. For more information on video formats and importing to Flash, see "Video Fundamentals" at www.macromedia.com/support/flash/.

The following video-editing applications are supported by the FLV Export plug-in:

- Adobe After Effects (Windows and Macintosh)
- Anystream Agility (Windows)
- Apple FinalCut Pro (Macintosh)
- Apple QuickTime Pro (Macintosh)
- Avid Xpress DV (Windows and Macintosh)
- Discreet Cleaner (Windows and Macintosh)
- Discreet Cleaner XL (Windows and Macintosh)

You can install the FLV Export plug-in after installation of Flash MX Professional 2004 is complete. The plug-in is placed in the QuickTime folder. From this location, the FLV Export plug-in is available to any application that uses QuickTime 6.1.1, even programs added after the FLV installation.

To install the FLV Export plug-in:

- Click the installer and follow the onscreen instructions.

When you export video from an editing application, the Flash Video (FLV) Exporter is used to set various encoding options. The Flash Video Exporter is divided into three main sections: Video, Audio, and Other. The Video section contains the encoding options for your FLV video, Audio contains the bitrate options for your MP3 audio encoding, and Other allows you to set your scaling and deinterlacing options.

To export an FLV file from a supported application:

1 With the video open in the video-editing application, select File > Export > QuickTime.

2 In the Export dialog box, under Export, select Macromedia Flash Video (FLV), and then click Options.

3 In the Flash Video (FLV) Exporter dialog box, select an Encoding Method from the pop-up menu:

Baseline (1 Pass) is the most basic method of encoding. It reads through the file once, compresses each frame as it is loaded, and estimates the bit rate for each frame. The resulting file size is closely related to the value entered in the Limit Data Rate To text box, since the data rate can not vary on a frame-by-frame basis even if more or less data is needed.

Better (1 Pass VBR) is the same as Baseline but encodes using Variable Bitrate Encoding (VBR). VBR keeps the average bit rate at or below the target data rate specified for the video. This allows the data rate to fluctuate based on the content in the clip. If VBR can encode the frame with less data, it will. The resulting file looks similar to one created with the Baseline option, but the file size may be smaller.

Screen Recording Codec is for recording screen operations with a lossless compression. This compression optimizes content that depicts computer screens; for example, an instructional video that shows a pointer moving across a computer screen. When Screen Recording Codec is selected, Quality, Limit Data Rate To, and Motion Estimation are dimmed.

4 For Frames per Second, enter a value or select a frame rate from the pop-up menu. To maintain the temporal quality of the original source clip, use the same frame rate as that of the original source. If you are dropping the frame rate to lower the data rate, the frames per second should be an evenly divisible number from the source frame rate (e.g., one-half or one-quarter the original rate). The pop-up menu next to the Frames per Second text box contains commonly used frame rates.

5 For Limit Data Rate To, do one of the following:

- Select a preset Quality setting (Normal, Better, or Best) to automatically select a Limit Data Rate value. This value is determined by the output FLV file's resolution and frame rate. When you select Low, Medium, and High from this menu, the Limit Data Rate To text box updates to reflect the value chosen.

- Use the pop-up window to select a value for Kilobits/Sec.

- If you find that the preset quality settings are not working with your particular source footage, enter a higher data rate in the Limit Data Rate To text box.

6 For Keyframe, enter a value to control the frequency of keyframes (frames with complete data) in the video clip. For example, for a keyframe interval of 30, Flash stores a complete frame every 30 frames in the clip. For frames between intervals, Flash stores only the data that changes from the preceding frame. A smaller interval stores more complete frames, resulting in a larger file size.

7 For Motion Estimation, select Faster for faster encoding and lower video quality, or Best for slower encoding and better video quality.

8 For Audio Encoding, select from the following options:

- Select Audio to export audio content with the video file. Deselect this option to export no audio with the file.

- Select Mono to export all audio content in one channel, or Stereo to export audio content in stereo.

- For Bitrate, specify the maximum bit rate at which the audio content will be transmitted. (Audio is encoded separately from the video content in the file and can have a different bit rate.)

9 Under Other, do one of the following to resize the video:

- Select a preset image size from the pop-up menu.

- Specify values for Width and Height, in pixels.

- Specify a percentage of the original image size.

10 Check Lock Aspect Ratio to keep the aspect ratio the same size as the original clip.

11 For Deinterlacing, select None to apply no deinterlacing, Lower to deinterlace for NTSC format, or Upper to deinterlace for PAL format. This option allows you to choose whether to strip the Upper or Lower field from the interlaced source video file.

12 Click OK.

13 Select a location where the exported file will be saved, and click Save.

Playing FLV video clips with media components (Flash Professional only)

With Flash MX Professional 2004 media components, you can quickly and easily add Flash video and playback controls to your documents. Then, using cue points, you can synchronize your video with animation, text, and graphics. For example, you can create a Flash presentation that has video playing in one area of the screen while text and graphics are displayed in another area. A cue point placed in the video triggers an update to the text and graphic, enabling them to remain relevant to the content of the video.

The media component suite consists of three components: MediaDisplay, MediaController, and MediaPlayback. With the MediaDisplay component, adding media to your Flash documents is as simple as dragging the component to the Stage and configuring it in the Component Inspector panel. In addition to setting the parameters in the Component Inspector panel, you can add cue points to trigger other actions. The MediaDisplay component has no visual representation during playback. Only the video clip is visible. For more information, see "MediaDisplay component" in Using Components Help.

The MediaController component provides user interface controls that let the user interact with streaming media. The Controller features Play, Pause, and Rewind to Start buttons and a volume control. It also includes playbars that show how much of the media has loaded, and how much has played. A playhead slider can be dragged forward and backward on the playbar to navigate quickly to different parts of the video. Using Behaviors or ActionScript, you can easily link this component to the MediaDisplay component to display streaming video and provide user control. See "MediaController component" in Using Components Help.

The MediaPlayback component provides the easiest and quickest way to add video and a controller to your Flash documents. The MediaPlayback component combines the MediaDisplay and MediaController components into a single, integrated component. The MediaDisplay and MediaController component instances are automatically linked to each other for playback control. For more information, see "MediaPlayback component" in Using Components Help.

You use the Component Inspector panel to configure parameters for playback, size, and layout for all three components. All the media components work equally well with MP3 audio content.

To add a MediaPlayback component to a Flash document:

1 Open the Components panel (Windows > Development Panels > Components) and drag the MediaPlayback component to the Stage. See "Adding components to Flash documents" in the Using Components Help.

2 With the component selected, open the Property inspector (Windows > Properties) and enter an instance name.

3 Open the Component Inspector panel (Windows > Development Panels > Component Inspector) and select FLV (default setting) for the media type.

4 Enter values for parameters or use default settings:

Video Length is used by the playbar component to determine progress of the playback.

Milliseconds determines whether the playbar and cue points use frames or milliseconds.

fps sets the number of frames per second for video playback. When Milliseconds is selected, the frames per second control is disabled.

URL sets the path and filename or URL for the media.

Automatically Play sets the media to play as soon as it is available.

Use Preferred Media Size displays the FLV video clip at its native size and aspect ratio. When deselected, the media conforms to the height and width set in the component inspector.

Respect Aspect Ratio retains the original aspect ratio of the media when selected.

Control Placement determines if the controller will sit above, below, to the right or to the left of the video clip.

Control Visibility determines whether the Controller opens or closes based on mouse position, or is locked in the open or closed state.

To add a MediaDisplay component to a Flash document:

1   Open the Components panel (Windows > Development Panels > Components) and drag the MediaDisplay component to the Stage. See "Adding components to Flash documents" in the Using Components Help.

2   With the component selected, open the Property inspector (Windows > Properties) and enter an instance name.

3   Open the Component Inspector panel (Windows > Development Panels > Component Inspector) and select FLV (Default setting) for the media type.

4   Enter values for parameters or use default settings:

Video Length is used by the playbar component to determine progress of the playback.

Milliseconds determines whether the playbar and cue points use frames or milliseconds.

fps sets the number of frames per second for video playback. When Milliseconds is selected, the frames per second control is disabled.

URL sets the path and filename or URL for the media.

Automatically Play sets the media to play as soon as it is available.

Use Preferred Media Size displays the FLV video clip at it's native size and aspect ratio. When deselected, the media conforms to the height and width set in the component inspector.

Respect Aspect Ratio retains the original aspect ratio of the media when selected.

To add a MediaController to a Flash document:

1   Open the Components panel (Windows > Development Panels > Components) and drag the MediaController component to the Stage. See "Adding components to Flash documents" in Using Components Help.

2   With the component selected, open the Property inspector (Windows > Properties) and enter an instance name for the component.

3   Open the Component Inspector panel set the following parameters:

ActivePlayControl sets the playbar in Play or Pause when the SWF file opens. Use this parameter with Automatically Play in the MediaDisplay component.

BackgroundStyle indicates whether the background of the controller displays as default or as none.

ControllerPolicy determines whether the Controller opens or closes based on mouse position, or is locked in the open or closed state.

Horizontal determines whether the Controller orientation is vertical or horizontal.

Enabled allows the user to access the playback controls.

Visible allows the user to see the Controller.

MinHeight sets the minimum height (in pixels) allowable for this instance.

MinWidth sets the minimum width (in pixels) allowable for this instance.

The media components use events to interact with other elements in a Flash document, including each other. The MediaController instance broadcasts events when its buttons are clicked or its sliders are dragged. The MediaDisplay instance broadcasts events when playback starts and finishes, the playhead moves, media is downloaded from the source, and when cue points are passed by the playhead.

In order for the MediaController and MediaDisplay instances to work together, they must listen for events from each other and respond appropriately. For example, when a user clicks the Pause button on the MediaController, it broadcasts a "click" event with a detail property of "pause". When the MediaDisplay instance receives the event, it responds by pausing playback.

Flash MX Professional 2004 includes two behaviors, Associate Controller and Associate Display, that connect the MediaDisplay and MediaController components instances. Only one of the two behaviors is necessary to link the two components. The end result is identical with either behavior.

To link a MediaDisplay instance to a MediaController instance:

1   With a MediaDisplay instance and a MediaController instance added to your document (see "To add a MediaDisplay component to a Flash document:" on page 182 and "To add a MediaController to a Flash document:" on page 182), select the MediaDisplay instance.

2   In the Behaviors panel (Window > Development Panels > Behaviors), click the Add (+) button and select the Associate Controller behavior from the Media submenu.

3   In the Associate Controller dialog box, browse to the location of the MediaController instance and select it. If you have not named the instance, you will be asked to enter a name; then click OK.

    The behavior inserts the code that enables the component instances to listen to each other.

Defining cue points (Flash Professional only)

A cue point triggers an action when the playhead position equals the value entered in the Position fields. Each cue point consists of a name and the time at which it occurs. By default, cue point times are specified in "hour : minute : second : frame" format, with a default frame rate of 30 frames per second and can be set to any frame rate. Cue points work with milliseconds or frame numbers.

Cue Points also can be added and removed through ActionScript with the addCuePoint () and removeCuePoint () methods. For more information, see "MediaDisplay component" in Using Components Help. For more information, see "MediaPlayback component" in Using Components Help.

To add a cue point to a MediaDisplay instance:

1   Select the MediaDisplay instance.

2   In the Component Inspector (Window > Development Panels > Component Inspector), click the Add (+) button in the Cue Point panel.

3   Enter the name of the frame or slide, and the time the action is to be triggered.

Adding actions to a cue point (Flash Professional only

Flash MX Professional 2004 provides two cue point behaviors for adding actions to a Flash document, Labeled Frame CuePoint Navigation and Slide CuePoint Navigation. The Labeled Frame CuePoint Navigation behavior adds an action that instructs the Timeline to navigate to a frame with the same name as a given cue point. The Slide CuePoint Navigation behavior instructs a slide-based Flash document to navigate to a slide with the same name as a given cue point and time.

To add a Labeled Frame CuePoint Navigation behavior:

1 Add a blank keyframe (Insert > Timeline > Blank Keyframe) on the same Timeline as the MediaDisplay or MediaPlayback component, and enter a frame label in the Properties inspector.

2 Select the MediaDisplay or MediaPlayback component that will trigger the action.

3 In the Behaviors panel (Window > Development Panels > Behaviors), click the Add (+) button and select the Labeled Frame CuePoint Navigation behavior from the Media submenu.

4 Select the timeline where your frame label reside (in most cases _root) in the Labeled Frame CuePoint Navigation dialog box.

5 Select Relative and click OK.

When the video plays for the amount of time indicated with the cue point, the Flash document navigates to the frame label entered in the cue point.

To add a Slide CuePoint Navigation behavior:

1 Create a slide presentation and name each screen. For more information, see Chapter 12, "Working with Screens (Flash Professional Only)," on page 197.

2 Select the MediaDisplay or MediaPlayback component that will trigger the action.

3 In the Behaviors panel (Window > Development Panels > Behaviors), click the Add (+) button and select the Slide CuePoint Navigation behavior from the Media submenu.

4 Select the main slide of your presentation in the Slide CuePoint Navigation dialog box.

5 Select Relative and click OK.

When the video plays for the amount of time indicated with the CuePoint, the Flash document navigates to the screen entered in the CuePoint.

CHAPTER 11
Working with Sound

Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 offer a number of ways to use sounds. You can make sounds that play continuously, independent of the Timeline, or you can synchronize animation to a sound track. You can add sounds to buttons to make them more interactive, and make sounds fade in and out for a more polished sound track.

There are two types of sounds in Flash: event sounds and stream sounds. An event sound must download completely before it begins playing, and it continues playing until explicitly stopped. Stream sounds begin playing as soon as enough data for the first few frames has been downloaded; stream sounds are synchronized to the Timeline for playing on a website.

You select compression options to control the quality and size of sounds in exported SWF files. You can select compression options for individual sounds using the Sound Properties dialog box, or define settings for all sounds in the document in the Publish Settings dialog box.

You can use sounds in shared libraries, to link a sound from one library to multiple documents. See "Using shared library assets" on page 61. You can also use the ActionScript onSoundComplete event to trigger an event based on the completion of a sound. See "About the onSoundComplete event" on page 191.

You can use behaviors that are prewritten ActionScript scripts to load and control the playback of sounds. Like behaviors, the media components contain prewritten ActionScript scripts to load and control sounds (MP3 sounds only) but also provide a controller for stop, pause, rewind, and so on. For more information on using the media components, see "Playing FLV video clips with media components (Flash Professional only)" on page 180.

Note: You can also use actions to load sounds dynamically. See Sound.attachSound () and Sound.loadSound () in ActionScript Dictionary Help.

Importing sounds

You place sound files into Flash by importing them into the library for the current document.

Note: When placing a sound on the Timeline, you place it on a separate layer. For more information, see "Adding sounds to a document" on page 187.

You can import the following sound file formats into Flash:

- WAV (Windows only)
- AIFF (Macintosh only)
- MP3 (Windows or Macintosh)

If you have QuickTime 4 or later installed on your system, you can import these additional sound file formats:

- AIFF (Windows or Macintosh)
- Sound Designer II (Macintosh only)
- Sound Only QuickTime Movies (Windows or Macintosh)
- Sun AU (Windows or Macintosh)
- System 7 Sounds (Macintosh only)
- WAV (Windows or Macintosh)

Flash stores sounds in the library along with bitmaps and symbols. As with graphic symbols, you need only one copy of a sound file to use that sound in any number of ways in your document.

If you want to share sounds among Flash documents, you can include the sounds in shared libraries. See "Working with common libraries" on page 18. To use a sound in a shared library, you assign the sound file an identifier string in the Symbol Linkage Properties dialog box. The identifier can also be used to access the sound as an object in ActionScript. For information on objects in ActionScript, see "Using sounds with Sound objects" on page 189.

Sounds can use considerable amounts of disk space and RAM. However, MP3 sound data is compressed and smaller than WAV or AIFF sound data. Generally, when using WAV or AIFF files, it's best to use 16-bit 22 kHz mono sounds (stereo uses twice as much data as mono), but Flash can import either 8- or 16-bit sounds at sample rates of 11 kHz, 22 kHz, or 44 kHz. Flash can convert sounds to lower sample rates on export. See "Compressing sounds for export" on page 192.

Note: Sounds recorded in formats that are not multiples of 11 kHz (such as 8, 32, or 96 kHz) are resampled when imported into Flash.

If you want to add effects to sounds in Flash, it's best to import 16-bit sounds. If you have limited RAM, keep your sound clips short or work with 8-bit sounds instead of 16-bit sounds.

To import a sound:

1 Select File > Import > Import to Library.

2 In the Import dialog box, locate and open the desired sound file.

Note: You can also drag a sound from a common library into the library for the current document. See "Working with common libraries" on page 18.

Adding sounds to a document

To add a sound to a document from the library, you assign the sound to a layer and set options in the Sound controls in the Property inspector. It is recommended that you place each sound on a separate layer.

You can load a sound into a SWF file during runtime, using the loadSound method of the Sound object. For more information, see Sound.loadSound() in ActionScript Dictionary Help.

To test sounds that you add to a document, you can use the same methods you use to preview frames or test SWF files: drag the playhead over the frames containing the sound, or use commands in the Controller or the Control menu.

To add a sound to a document:

1 Import the sound into the library if it has not already been imported. See "Importing sounds" on page 186.

2 Select Insert > Timeline > Layer to create a layer for the sound.

3 With the new sound layer selected, drag the sound from the Library panel onto the Stage. The sound is added to the current layer.

> You can place multiple sounds on one layer, or on layers containing other objects. However, it is recommended that each sound be placed on a separate layer. Each layer acts like a separate sound channel. The sounds on all layers are combined when you play back the SWF file.

4 In the Timeline, select the first frame that contains the sound file.

5 Select Window > Properties and click the arrow in the lower right corner to expand the Property inspector.

6 In the Property inspector, select the sound file from the Sound pop-up menu.

7 Select an effect option from the Effects pop-up menu:

None applies no effects to the sound file. Select this option to remove previously applied effects.

Left Channel/Right Channel plays sound in the left or right channel only.

Fade Left to Right/Fade Right to Left shifts the sound from one channel to the other.

Fade In gradually increases the amplitude of a sound over its duration.

Fade Out gradually decreases the amplitude of a sound over its duration.

Custom lets you create your own In and Out points of sound using the Edit Envelope. See "Using the sound-editing controls" on page 189.

8 Select a synchronization option from the Sync pop-up menu:

Event synchronizes the sound to the occurrence of an event. An event sound plays when its starting keyframe is first displayed and plays in its entirety, independently of the Timeline, even if the SWF file stops playing. Event sounds are mixed when you play your published SWF file.

An example of an event sound is a sound that plays when a user clicks a button. If an event sound is playing and the sound is instantiated again (for example, by the user clicking the button again) the first instance of the sound continues to play and another instance begins to play simultaneously.

Start is the same as Event, except that if the sound is already playing, no new instance of the sound is played.

Stop silences the specified sound.

Stream synchronizes the sound for playing on a website. Flash forces animation to keep pace with stream sounds. If Flash can't draw animation frames quickly enough, it skips frames. Unlike event sounds, stream sounds stop if the SWF file stops playing. Also, a stream sound can never play longer than the length of the frames it occupies. Stream sounds are mixed when you publish your SWF file.

An example of a stream sound is the voice of a character in an animation that plays in multiple frames.

Note: If you use an MP3 sound as a stream sound, you must recompress the sound for export. You can export the sound as an MP3 file, with the same compression settings that it had on import. See "Compressing sounds for export" on page 192.

9 Enter a value for Repeat to specify the number of times the sound should loop, or select Loop to repeat the sound continuously.

For continuous play, enter a number large enough to play the sound for an extended duration. For example, to loop a 15-second sound for 15 minutes, enter 60.

Note: Looping stream sounds is not recommended. If a stream sound is set to loop, frames are added to the file and the file size is increased by the number of times the sound is looped.

Adding sounds to buttons

You can associate sounds with the different states of a button symbol. Because the sounds are stored with the symbol, they work for all instances of the symbol.

To add sound to a button:

1 Select the button in the Library panel.

2 Select Edit from the options menu in the upper right corner of the panel.

3 In the button's Timeline, add a layer for sound.

4 In the sound layer, create a regular or blank keyframe to correspond to the button state to which you want to add a sound.

For example, to add a sound that plays when the button is clicked, create a keyframe in the frame labeled Down.

5 Click the keyframe you have just created.

6 Select Window > Properties.

7 In the Property inspector, select a sound file from the Sound pop-up menu.

8 Select Event from the Synchronization pop-up menu.

To associate a different sound with each of the button's keyframes, create a blank keyframe and add another sound file for each keyframe. You can also use the same sound file and apply a different sound effect for each button keyframe. See "Using the sound-editing controls" on page 189.

Using sounds with Sound objects

You can use the Sound object in ActionScript to add sounds to a document and to control sound objects in a document. Controlling sounds includes adjusting the volume or the right and left balance while a sound is playing. See "Creating sound controls" in ActionScript Reference Guide Help.

To use a sound in a Sound action, you assign an identifier string to the sound in the Symbol Linkage dialog box.

To assign an identifier string to a sound:

1 Select the sound in the Library panel.

2 Do one of the following:

   - Select Linkage from the options menu in the upper right corner of the panel.
   - Right-click (Windows) or Control-click (Macintosh) the sound name in the Library panel, and select Linkage from the context menu.

3 Under Linkage in the Symbol Linkage Properties dialog box, select Export for ActionScript.

4 Enter an identifier string in the text box, and then click OK.

About accessing ID3 properties in MP3 files with Flash Player

Macromedia Flash Player 7 and later supports ID3 v2.4 and v2.4 tags. With this version, when an MP3 sound is loaded using the `attachSound()` or `loadSound()` method, the ID3 tag properties are available at the beginning of the sound data stream. The onID3 event executes when the ID3 data is initialized.

Flash Player 6 release 40 and later supports MP3 files with ID3 v1.0 and v1.1 tags. With ID3 v1.0 and v1.1 tags, the properties are available at the end of the data stream. If a sound does not contain an ID3v1 tag, the ID3 properties are undefined. Users must have Flash Player 6 release 40 or later in order for the ID3 properties to function.

For more information on using the ID3 properties, see `Sound.ID3` in ActionScript Dictionary Help.

Using the sound-editing controls

To define the starting point of a sound or to control the volume of the sound as it plays, you use the sound-editing controls in the Property inspector.

Flash can change the point at which a sound starts and stops playing. This is useful for making sound files smaller by removing unused sections.

To edit a sound file:

1 Add a sound to a frame (see "Adding sounds to a document" on page 187), or select a frame already containing a sound.

2 Select Window > Properties.

3 Click the Edit button on the right side of the Property inspector.

4 Do any of the following:

- To change the start and end points of a sound, drag the Time In and Time Out controls in the Edit Envelope.

- To change the sound envelope, drag the envelope handles to change levels at different points in the sound. Envelope lines show the volume of the sound as it plays. To create additional envelope handles (up to eight total), click the envelope lines. To remove an envelope handle, drag it out of the window.

- To display more or less of the sound in the window, click the Zoom In or Out buttons.

- To switch the time units between seconds and frames, click the Seconds and Frames buttons.

5 To hear the edited sound, click the Play button.

Controlling sound playback using behaviors

You can control sound playback using sound behaviors. Behaviors are prewritten ActionScript scripts that you apply to an object, such as a button, to control a target object, such as a sound. Behaviors enable you to add the power, control, and flexibility of ActionScript coding to your document without having to create the ActionScript code yourself.

You can use the Load Sound from Library or Load Streaming MP3 File behaviors to add a sound to your document. Adding a sound using these behaviors creates an instance of the sound. The instance name is then used to control the sound.

To control a sound with a behavior, you use the Behaviors panel to apply the behavior to a triggering object, such as a button. You specify the event that triggers the behavior (such as clicking the button), select a target object (the sound to be affected by the behavior), and select settings for the behavior parameters to specify how the behavior executes.

To load a sound to a file using a behavior:

1 Select the object, such as a button, that you want to use to trigger the behavior.

2 In the Behaviors panel (Window > Development Panels > Behaviors), click the Add (+) button and select either Load Sound from Library or Load Streaming MP3 File from the Sound submenu.

3 In the dialog box that appears, enter the linkage identifier (see "Using sounds with Sound objects" on page 189) or sound location (external MP3 file). Next, enter a name for this instance of the sound and click OK.

4 Under Event, click On Release (the default event) and select a mouse event from the menu. If you want to use the OnRelease event, leave the option unchanged.

To control a sound using a behavior:

1   Select the object, such as a button, that you want to use to trigger the behavior.

2   In the Behaviors panel (Window > Development Panels > Behaviors), click the Add (+) button and select the desired behavior from the Sound submenu.

The default event and actions for the behavior appear in the Behaviors panel.

3   Under Event, click On Release (the default event) and select a mouse event from the menu. If you want to use the OnRelease event, leave the option unchanged.

4   In the dialog box that appears, select the target object (the sound to be affected by the behavior) from the Target dialog box.

5   Select settings for the behavior parameters and click OK.

Starting and stopping sounds at keyframes

The most common sound-related task in Flash is starting and stopping sounds at keyframes in synchronization with animation.

To stop and start a sound at a keyframe:

1   Add a sound to a document. See "Adding sounds to a document" on page 187.

To synchronize this sound with an event in the scene, select a beginning keyframe that corresponds to the keyframe of the event in the scene. You can select any of the synchronization options.

2   Create a keyframe in the sound layer's Timeline at the frame where you want the sound to end.

A representation of the sound file appears in the Timeline.

3   Select Window > Properties and click the arrow in the lower right corner to expand the Property inspector.

4   In the Property inspector, select the same sound from the Sound pop-up menu.

5   Select Stop from the Synchronization pop-up menu.

When you play the SWF file, the sound stops playing when it reaches the ending keyframe.

6   To play back the sound, simply move the playhead.

About the onSoundComplete event

The onSoundComplete event of the ActionScript Sound object enables you to trigger an event in a Flash application based on the completion of an attached sound file. The Sound object is a built-in object that lets you control sounds in a Flash application. For more information, see "Sound class" in ActionScript Dictionary Help. The onSoundComplete event of a Sound object is invoked automatically when the attached sound file finishes playing. If the sound is looped a finite number of times, the event is triggered when the sound finishes looping.

The Sound object has two properties that you can use in conjunction with the onSoundComplete event. The duration property is a read-only property representing the duration in milliseconds of the sound sample attached to the sound object. The position property is a read-only property representing the number of milliseconds the sound has been playing in each loop.

The onSoundComplete event enables you to manipulate sounds in a variety of powerful ways, such as the following:

- Creating a dynamic playlist or sequencer
- Creating a multimedia presentation that checks for narration completion before advancing to the next frame or scene
- Building a game that synchronizes sounds to particular events or scenes and transitions smoothly between different sounds
- Timing an image change to a sound—for example, changing an image when a sound is half over

Compressing sounds for export

You can select compression options for individual event sounds and export the sounds with those settings. You can also select compression options for individual stream sounds. However, all stream sounds in a document are exported as a single stream file, using the highest setting of all those applied to individual stream sounds. This includes stream sounds in video objects.

You select compression options for individual sounds in the Sound Properties dialog box. You can also select global compression settings for event sounds or stream sounds in the Publish Settings dialog box. These global settings are applied to individual event sounds or all stream sounds if you do not select compression settings for the sounds in the Sound Properties dialog box. See "Publishing Flash documents" on page 281.

You can also override export settings specified in the Sound Properties dialog box by selecting Override Sound Settings in the Publish Settings dialog box. This option is useful if you want to create a larger high-fidelity audio file for local use and a smaller low-fidelity version for the web. See "Setting publish options for the Flash SWF file format" on page 282.

The sampling rate and degree of compression make a significant difference in the quality and size of sounds in exported SWF files. The more you compress a sound and the lower the sampling rate, the smaller the size and the lower the quality. You should experiment to find the optimal balance between sound quality and file size.

When working with imported MP3 files, you can export the files in MP3 format using the same settings that the files had when imported.

Note: In Windows, you can also export all the sounds from a document as a WAV file using File › Export › Export Movie. See "Exporting Flash content and images" on page 311.

To set export properties for an individual sound:

1 Do one of the following:
- Double-click the sound's icon in the Library panel.
- Right-click (Windows) or Control-click (Macintosh) a sound file in the Library panel and select Properties from the context menu.
- Select a sound in the Library panel and select Properties from the options menu in the upper right corner of the panel.
- Select a sound in the Library panel and click the properties icon at the bottom of the Library panel.

2 If the sound file has been edited externally, click Update.

3 For Compression, select Default, ADPCM, MP3, Raw, or Speech. To select options for a compression format you choose, see the section corresponding to the selected format:

- "Using the ADPCM compression option" on page 193
- "Using the MP3 compression option" on page 193
- "Using the Raw compression option" on page 194
- "Using the Speech compression option" on page 194

4 Set export settings.

5 Click Test to play the sound once. Click Stop if you want to stop testing the sound before it has finished playing.

6 Adjust export settings if necessary until the desired sound quality is achieved.

7 Click OK.

The Default compression option uses the global compression settings in the Publish Settings dialog box when you export your SWF file. If you select Default, no additional export settings are available.

Using the ADPCM compression option

The ADPCM compression option sets compression for 8-bit or 16-bit sound data. Use the ADPCM setting when you are exporting short event sounds such as button clicks.

To use ADPCM compression:

1 In the Sound Properties dialog box, select ADPCM from the Compression menu.

2 For Preprocessing, select Convert Stereo to Mono to convert mixed stereo sounds to mono (monaural). (Mono sounds are unaffected by this option.)

3 For Sample Rate, select an option to control sound fidelity and file size. Lower rates decrease file size but can also degrade sound quality. Rate options are as follows:

5 kHz is barely acceptable for speech.

11 kHz is the lowest recommended quality for a short segment of music and is one-quarter of the standard CD rate.

22 kHz is a popular choice for web playback and is half the standard CD rate.

44 kHz is the standard CD audio rate.

Note: Flash cannot increase the kHz rate of an imported sound above the rate at which it was imported.

Using the MP3 compression option

The MP3 compression option lets you export sounds with MP3 compression. Use MP3 when you are exporting longer stream sounds such as music sound tracks.

If you are exporting a file that was imported in MP3 format, you can export the file using the same settings the file had on import.

To export an imported MP3 file with the same settings the file had on import:

1 In the Sound Properties dialog box, select MP3 from the Compression menu.

2 Select Use Imported MP3 Quality (the default setting). Deselect this option to select other MP3 compression settings, as defined in the procedure below.

To use MP3 compression:

1 In the Sound Properties dialog box, select MP3 from the Compression menu.

2 Deselect Use Imported MP3 Quality (the default setting).

3 For Bit Rate, select an option to determine the bits per second in the exported sound file. Flash supports 8 Kbps through 160 Kbps CBR (constant bit rate). When you are exporting music, set the bit rate to 16 Kbps or higher for the best results.

4 For Preprocessing, select Convert Stereo to Mono to convert mixed stereo sounds to mono (monaural). (Mono sounds are unaffected by this option.)

   Note: The Preprocessing option is available only if you select a bit rate of 20 Kbps or higher.

5 For Quality, select an option to determine the compression speed and sound quality:

   Fast yields faster compression but lower sound quality.

   Medium yields somewhat slower compression but higher sound quality.

   Best yields the slowest compression and the highest sound quality.

Using the Raw compression option

The Raw compression option exports sounds with no sound compression.

To use raw compression:

1 In the Sound Properties dialog box, select Raw from the Compression menu.

2 For Preprocessing, select Convert Stereo to Mono to convert mixed stereo sounds to mono (monaural). (Mono sounds are unaffected by this option.)

3 For Sample Rate, select an option to control sound fidelity and file size. Lower rates decrease file size but can also degrade sound quality. Rate options are as follows:

   5 kHz is barely acceptable for speech.

   11 kHz is the lowest recommended quality for a short segment of music and is one-quarter of the standard CD rate.

   22 kHz is a popular choice for web playback and is half the standard CD rate.

   44 kHz is the standard CD audio rate.

   Note: Flash cannot increase the kHz rate of an imported sound above the rate at which it was imported.

Using the Speech compression option

The speech compression option exports sounds using a compression specially adapted to speech.

To use speech compression:

1 In the Sound Properties dialog box, select Speech from the Compression menu.

2 For Sample Rate, select an option to control sound fidelity and file size. A lower rate decreases file size but can also degrade sound quality. Select from the following options:

   5 kHz is acceptable for speech.

   11 kHz is recommended for speech.

   22 kHz is acceptable for most types of music on the web.

   44 kHz is the standard CD audio rate. However, because compression is applied, the sound is not CD quality in the SWF file.

Guidelines for exporting sound in Flash documents

Besides sampling rate and compression, there are several ways to use sound efficiently in a document and keep file size down:

- Set the in and out points to prevent silent areas from being stored in the Flash file and to reduce the size of the sound.

- Get more out of the same sounds by applying different effects for sounds (such as volume envelopes, looping, and in/out points) at different keyframes. You can get a number of sound effects using only one sound file.

- Loop short sounds for background music.

- Do not set streaming sound to loop.

- When exporting audio in embedded video clips, keep in mind that the audio is exported using the global streaming settings selected in the Publish Settings dialog box.

- Use stream synchronization to keep the animation synchronized to your sound track when you preview your animation in the editor. If your computer is not fast enough to draw the animation frames so that they keep up with your sound track, Flash skips frames.

- When exporting QuickTime movies, use as many sounds and channels as you want without worrying about file size. The sounds are combined into a single sound track when you export as a QuickTime file. The number of sounds you use has no effect on the final file size.

Using sounds in Flash documents for mobile devices (Flash Professional only)

With Flash MX Professional 2004, you can include event sounds when authoring documents for playback on mobile devices. The general process and tools required to embed sound are described in this section. For detailed information on authoring for mobile devices, see the Content Development Kits on the Mobile and Devices Development Center at www.macromedia.com/devnet/devices.

Flash does not support sound file formats used for mobile devices (such as MIDI and others); when authoring for mobile devices, you must temporarily place a proxy sound in a supported format such as MP3, WAV, or AIFF in the Flash document. The proxy sound in the document is then linked to an external mobile device sound, such as a MIDI file. During the document publishing process, the proxy sound is replaced with the linked external sound. The SWF file generated contains the external sound and uses it for playback on a mobile device.

When adding sounds to Flash documents for playback on mobile devices, keep the following in mind:

- This feature works with event sounds only.

- The Effect, Sync, Edit, and Loop options are not supported on mobile devices.

- You must specify an external device sound file for each sound in a document.

- As with all external files, the device sound file must be available during the publishing process but is not needed by the SWF file for playback.

To add an event sound to a Flash document for playback on a mobile device:

1 Import a sound file to the library in the Flash document (File > Import > Import to Library). For information on supported file formats and importing procedures, see "Importing sounds" on page 186.

2 In the Library panel, right-click (Windows) or Control-click (Macintosh) the sound and select Properties.

3 In the Device sound text box, enter a path or click the folder icon and browse to the location where the mobile device sound file is located. Click OK to close the Property inspector.

4 Add a button instance to the Stage from the Buttons common library (Window > Other Panels > Common Libraries > Buttons). For more on the common libraries, see "Working with common libraries" on page 18.

5 Add the linked sound to the Hit frame of the button. For more information, see "Adding sounds to buttons" on page 188.

6 Open the Publish Settings dialog box (File > Publish Settings), and click the Flash tab.

7 Select Export Device Sounds. Flash Lite is automatically selected from the Version pop-up menu. Click OK.
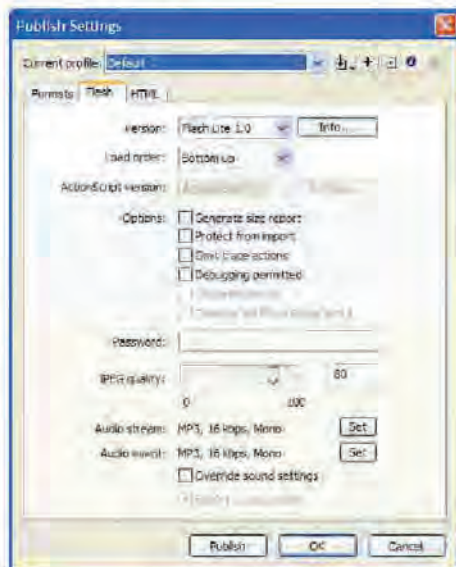
The SWF file now contains the linked mobile device sound.

8 Select Control > Test Movie to test your Flash application.

9 Select Control > Disable Keyboard Shortcuts.

10 Press Tab to select the button, and then press Enter or Return to play the sound.

Note: Depending on which device you are developing for, certain restrictions may apply to how an event sound is triggered. For more details, see Mobile Articles on the Mobile and Devices Development Center at www.macromedia.com/devnet/devices.

CHAPTER 12
Working with Screens (Flash Professional Only)

In Macromedia Flash MX Professional 2004, screens provide an authoring user interface with structural building blocks that make it easy for you to create complex, hierarchical Flash documents, such as slide presentations or form-based applications.

Screens provide high-level containers for creating applications. With screens, you can structure complex applications in Flash without using multiple frames and layers on the main Timeline. In fact, you can create a complex application without viewing the main Timeline at all.

When you author a screen-based document, the screens are arranged in a structured hierarchy that you create. You structure the document by nesting screens in a branching tree. You can easily preview and modify the structure of a screen-based document.

You can create screen-based documents of two different types: a Flash Slide Presentation, suitable for sequential content such as a slide show or multimedia presentation, or a Flash Form Application, ideal for nonlinear, form-based applications, including Rich Internet Applications. Screen-based documents can be saved in Flash Player 6 format or later only, not in any earlier Flash Player format.
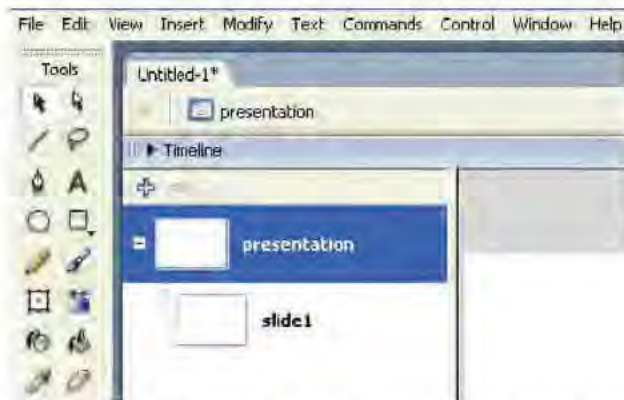
Detail of default workspace for a new Flash Slide Presentation. Screen thumbnails appear in the Screen Outline pane on the left side of the workspace, and the Timeline is collapsed.

Understanding screen-based documents and the screen authoring environment (Flash Professional only)

The authoring environment for screen-based documents provides a variety of ways for you to work with these documents. For information on the types of documents you can create with screens, ways to organize and navigating screens, and ways to use ActionScript, components, or Flash accessibility features with screens, see the following sections:

- "Slide presentations and form applications (Flash Professional only)" on page 198
- "Document structure and hierarchy (Flash Professional only)" on page 199
- "Slide screens and form screens (Flash Professional only)" on page 200
- "Using the Screen Outline pane (Flash Professional only)" on page 200
- "About undoing and redoing commands with screens (Flash Professional only)" on page 201
- "Using the screens context menu (Flash Professional only)" on page 201
- "About using the Movie Explorer with screens (Flash Professional only)" on page 211
- "About using Timelines with screens (Flash Professional only)" on page 211
- "About using ActionScript with screens (Flash Professional only)" on page 212
- "About using components with screens (Flash Professional only)" on page 214
- "Accessibility in the Flash screens authoring environment (Flash Professional only)" on page 214

Workflow for authoring screen-based documents (Flash Professional only)

To author a screen-based document, you first create a new Slide Presentation or Form Application document. Then you add screens, configure the screens and add content, and add behaviors to create controls and transitions for the screens.

For detailed information, see the procedures described in these sections:

- "Creating a new screen-based document (Flash Professional only)" on page 201
- "Adding screens to a document (Flash Professional only)" on page 202
- "Naming screens (Flash Professional only)" on page 203
- "Setting properties and parameters for a screen (Flash Professional only)" on page 204
- "About adding media content to screens (Flash Professional only)" on page 207
- "Selecting and moving screens (Flash Professional only)" on page 207
- "Creating controls and transitions for screens with behaviors (Flash Professional only)" on page 209

Slide presentations and form applications (Flash Professional only)

You can create screen-based documents of two different types. The type of document you choose determines the type of default screen in the document.

- A Flash Slide Presentation uses the slide screen as the default screen type. A slide screen has functionality designed for a sequential presentation.
- A Flash Form Application uses the form screen as the default screen type. A form screen has functionality designed for a nonlinear, form-based application, with multiple options available in one visual space.

Though each document has a default screen type, you can include both slide screens and form screens in any screen-based document. For information on slide and form screens, see "Slide screens and form screens (Flash Professional only)" on page 200.

Document structure and hierarchy (Flash Professional only)

Each document has a master screen at the top level. In a Flash Slide Presentation, the top-level screen is called Presentation by default. In a Flash Form Application, the top-level screen is called Application by default.

The top-level screen is the container for everything that you add to the document, including other screens. You can place content on the top-level screen. You cannot delete or move the top-level screen.

Screens are similar to nested movie clips in some ways: child screens inherit the behavior of their parents, and you use target paths in ActionScript to send messages from one screen to another. However, screens do not appear in the library, and you cannot create multiple instances of a screen. For information on using ActionScript with screens, see "About using ActionScript with screens (Flash Professional only)" on page 212.

You can add multiple screens to a document, and you can nest screens within other screens, in as many levels as you want. A screen that is inside another screen is the *child* of that screen. A screen that contains another screen is the *parent* of that screen. If a screen is nested several layers deep, all the screens above that screen are its *ancestors*. Screens that are at the same level are *sibling* screens. All screens nested in another screen are its *descendants*. A child screen contains all the content of its ancestor screens.
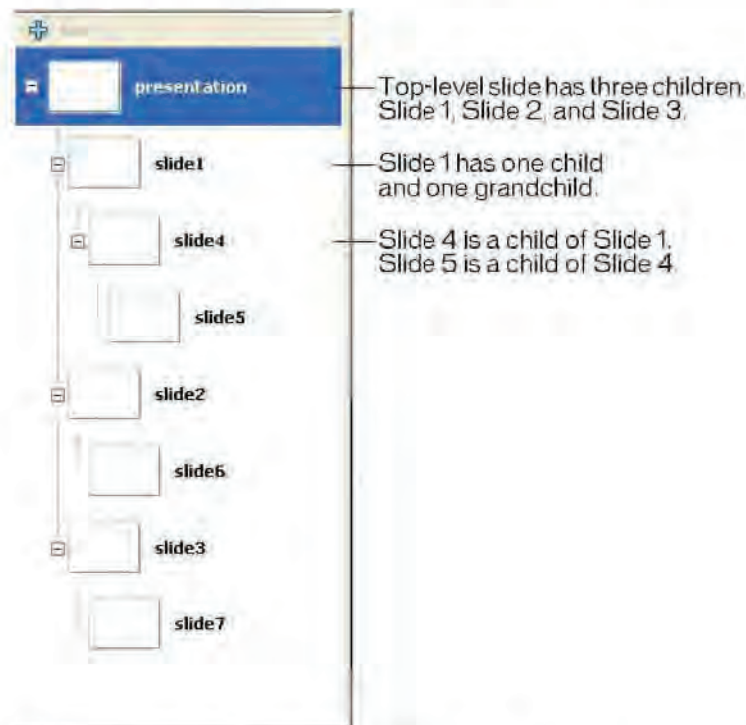
The Screen Outline pane for a Flash Slide Presentation containing screens nested three levels deep

Slide screens and form screens (Flash Professional only)

You can create two different types of screens in a document: slide screens and form screens. A Flash Slide Presentation uses the slide screen as the default screen type. A Flash Form Application uses the form screen as the default screen type. However, you can mix slide screens and form screens in any screen-based document to take advantage of the functionality of both and create more complex structure in a presentation or application.

You can set parameters for slide or form screens in the Property inspector. See "Setting parameters for a screen (Flash Professional only)" on page 206. You can also use ActionScript to control screens. See "Screen class," "Form class," and "Slide class" in Using Components Help.

Slide screens let you create Flash documents with sequential content, such as a slide show. Default behavior lets users navigate between slide screens using the arrow keys. Sequential screens can overlay one another so that the previous screen remains visible when the next slide is viewed. Screens can continue playing after they are hidden. Use slide screens when you want the visibility of each screen to be managed automatically.

Note: By default, arrow keys let you navigate between screens on the same level, not between nested screens. For an explanation of nested screens, see "Document structure and hierarchy (Flash Professional only)" on page 199.

Form screens let you create structured form-based applications, such as online registration or e-commerce forms. Form screens are simple containers that you use to structure a form-based application. By default, to create the navigation structure with form screens, you must write ActionScript. Use form screens when you want to manage the visibility of individual screens yourself.

Using the Screen Outline pane (Flash Professional only)

When you work with a screen-based document, the Screen Outline pane at the left of the Document window displays thumbnails of each screen in the current document, in a collapsible tree view. The tree represents the structural hierarchy of the document. Nested screens are indented below the screen that contains them.

When you add a screen to a document, the screen appears in the Screen Outline pane. See "Adding screens to a document (Flash Professional only)" on page 202.

You can collapse and expand the tree to hide and show nested screens. You can hide, show, and resize the Screen Outline pane.

By clicking on a screen thumbnail in the Screen Outline pane, you can display the screen on the Stage. For information on viewing screens in a document, see "Selecting and moving screens (Flash Professional only)" on page 207.

To hide or show the Screen Outline pane:

- Select Window > Screens.

To expand or collapse the tree:

- In Windows, click the Plus (+) or Minus (-) button next to a screen to show or hide the screens nested within it.
- On the Macintosh, click the triangle next to a screen to show or hide the screens nested within it.

To resize the Screen Outline pane:

* Drag the dividing line between the Screen Outline pane and the Document window.

About undoing and redoing commands with screens (Flash Professional only)

You can use the Edit > Undo and Edit > Redo menu commands to undo and redo the following actions performed on screens: adding, cutting, copying, pasting, deleting, and hiding a screen. The following actions performed on screens are recorded in the History panel: adding a screen, adding a nested screen, selecting a screen, renaming a screen, and deleting a screen. For information on the Undo and Redo commands and the History panel, see "Using the Undo, Redo, and Repeat menu commands" on page 31.

Using the screens context menu (Flash Professional only)

The screens context menu contains many commands for working with screens. You can insert screens, cut, copy and paste screens, and perform other operations with the context menu commands.

Note: Specific context menu commands are documented in sections describing those tasks. For example, to find information on the Insert Screen command, see "Adding screens to a document (Flash Professional only)" on page 202.

To view the context menu for a screen:

* Right-click (Windows) or Control-click (Macintosh) a screen thumbnail in the Screen Outline pane.

Creating a new screen-based document (Flash Professional only)

You can create a new screen-based document using one of two screen types:

* A Flash Slide Presentation uses the slide screen as the default screen type.
* A Flash Form Application uses the form screen as the default screen type.

For more information, see "Slide screens and form screens (Flash Professional only)" on page 200.

When you create a new screen-based document, it contains a top-level container screen and a single screen of the default type. Keep in mind that a screen-based document can be published only Flash Player 6 format or later, with ActionScript 2.0. You cannot save a screen-based document in any earlier Flash Player format.

You can create a new screen-based document from the Start page or from the New Document dialog box.

For information on the New Document dialog box, see "Creating or opening a document and setting properties" on page 9.

To create a new screen-based document from the Start page:

* Select a screen type for your document. Under Get Started, select one of the following from the Open a File options menu:

  Flash Slide Presentation creates a document with the slide screen as the default screen type.

  Flash Form Application creates a document with the form screen as the default screen type.

To create a new screen-based document from the New Document dialog box:

1 Select File > New.

2 Click the General tab and select one of the following under Type:

  Flash Slide Presentation creates a document with the slide screen as the default screen type.

  Flash Form Application creates a document with the form screen as the default screen type.

Adding screens to a document (Flash Professional only)

You can add a new screen at the same level as the currently selected screen. The new screen is a *sibling* screen of the selected screen. You can also add a nested screen one level below the currently selected screen. You can add a screen of the default screen type or select a screen type when you add a screen. You can view all screens in a document in the Screen Outline pane. See "Using the Screen Outline pane (Flash Professional only)" on page 200.

When you add screens to a document, Flash exhibits certain default behaviors:

* By default, Flash uses the screen type of the document (slide type for a Slide Presentation or form type for a Form Application) for the new screen. You can choose to insert a screen of another type, using the Insert Screen Type command in the screens context menu.
* Flash inserts the first screen you add directly after the top-level screen, one level below it.
* Flash inserts a new screen after the currently selected screen, at the same level. If the document contains nested screens below the currently selected screen, the new screen is added after the nested screens, at the same level as the selected screen.
* Flash inserts a new nested screen directly after the currently selected screen, and nested one level down. If the document already contains a nested screen or screens below the currently selected screen, the new screen is inserted after all nested screens already in place, one level below the selected screen.

You can also use a template to add a new screen or a series of screens. Flash MX Professional 2004 includes screen templates in various categories.

To add a screen of the default type at the current screen level:

1 Select a screen in the Screen Outline pane.

2 Do one of the following:
   ▪ Click the Insert Screen (+) button at the top of the Screen Outline pane.
   ▪ Select Insert > Screen.
   ▪ Select Insert Screen from the screens context menu.

To add a screen of a specified type at the current screen level:

1 Select a screen in the Screen Outline pane.

2 Select Insert Screen Type from the context menu and select a screen type.

To add a nested screen of the default type:

1 Select a screen in the Screen Outline pane.

2 Do one of the following:

   ■ Select Insert > Nested Screen.

   ■ Select Insert Nested Screen from the screens context menu.

To add a screen or series of screens based on a template:

1 Select a screen in the Screen Outline pane.

2 Select Insert Screen Type from the context menu and select Saved Templates.

3 Select a template category under Category, and then select a template under Templates.

4 Click OK to close the dialog box and add the template-based screen(s) to your document.

Naming screens (Flash Professional only)

By default, screens are named with their default type, in the order in which they are created: Slide 1, Slide 2, Form 1, Form 2, and so on. The creation order does not necessarily reflect the order of the screens in the Screen Outline pane. For example, you could create three sibling screens, Slide 1, Slide 2, and Slide 3. If you then create a nested screen directly below Slide 1, the nested screen is Slide 4.

You can rename screens, including the top-level screen. Screen names must be unique in a document. That is, you can have only one screen named *Quiz Page* in a document.

The default screen name is used as the instance name, which is used in ActionScript to control a screen. (See "About using ActionScript with screens (Flash Professional only)" on page 212.) If you change the default screen name, the instance name is updated with the new name; likewise, if you change the instance name, the screen name is updated. The linkage identifier for the screen is also identical to the screen name, and it is updated when the screen name or instance is updated.

Instance names must conform to the following requirements:

• The name must not contain any spaces.

• The first character must be a letter, underscore (_), or dollar sign ($).

• Each subsequent character must be a letter, number, underscore, or dollar sign.

• The instance name must be unique, regardless of case sensitivity. That is, you cannot have a screen named *screen1* and another screen named *Screen1* in the same application.

You can also change the instance name in the Property inspector. See "Setting properties and parameters for a screen (Flash Professional only)" on page 204.

To rename a screen:

• Double-click the screen name in the Screen Outline pane and enter a new name.

Setting properties and parameters for a screen (Flash Professional only)

You use the Property inspector to set properties and parameters for individual screens. On the left side of the Property inspector, you can view the instance name, width, height, and registration point of a screen:

- The instance name is a unique name assigned to a screen, used when you target the screen in ActionScript. Each screen is assigned a default instance name, based on its default name in the Screen Outline pane. The instance name and default screen name are also identical to the linkage identifier for the screen. If you update the instance name, the default screen name and the linkage identifier are also updated.

- Width and height are specified in pixels. The values in the W and H fields are read-only. Width and height are determined by the screen contents. You can autosnap the registration point to make sure it stays in the same relative position when the screen width and height change. See "Specifying the ActionScript class and registration point of a screen (Flash Professional only)" on page 205.

- The x and y coordinates of the screen's registration point are specified in pixels. You can also change the registration point using the registration point grid. See "Specifying the ActionScript class and registration point of a screen (Flash Professional only)" on page 205.

  You can move a child screen on the Stage by changing its x and y coordinates. If the Hide Screen context menu option for the child screen is selected (it is selected by default for slide screens only), you must select its parent screen in the Screen Outline pane, and then select the child screen on the Stage.

You can set parameters for slide and form screens, to control screen behavior during playback. See "Setting parameters for a screen (Flash Professional only)" on page 206.

To change the instance name of a screen:

1 Select a screen in the Screen Outline pane.

2 Select Window > Properties.

3 On the left side of the Property inspector, enter a name in the Instance Name text box.

   Note: If you update the instance name, the screen name in the Screen Outline pane and the linkage identifier for the screen are also updated.

To move a child screen on the Stage:

1 If the Hide Screen context menu option for the child screen is selected (the default setting for slide screens), deselect the option.

2 Select the screen's parent in the Screen Outline pane, and select the child screen on the Stage.

3 Select Window > Properties.

4 In the Property inspector, enter new values for the x and y coordinates.

Specifying the ActionScript class and registration point of a screen (Flash Professional only)

On the Properties tab of the Property inspector, you can specify the ActionScript class of the screen and its registration point:

- The ActionScript class specifies what class the screen belongs to. The class determines what methods and properties are available for the screen. By default, slide screens are assigned to the mx.screens.Slide class, and form screens are assigned to the mx.screens.Form class. You can assign the screen to a different class.

- The registration point grid indicates the position of the screen registration point in relation to its content. By default, the registration point of a slide screen is in the center, and the registration point of a form screen is in the upper left corner. You can change the registration point using the grid. You can use the Auto Snap option to keep the registration point in the same position in relation to screen contents, even when you add, remove, or reposition the screen contents.

Keep in mind that the height and width of a screen are determined by its content. Therefore, the upper left corner of a screen may not be the same as the upper left corner of the Stage.

Note: If you have changed the coordinate grid setting in the Info panel in another Flash document, the coordinate grid for the screen registration point may reflect that change. To check the Info panel coordinate grid setting, open a Flash document (a non-screen-based document) and select Window > Design Panels > Info. To change settings in the Info panel while working in a screen-based document, deselect all screens before you open the panel.

To change the ActionScript class of a screen:

1 Select a screen in the Screen Outline pane.

2 Select Window > Properties.

3 In the Property inspector, click the Properties tab.

4 Enter a class name in the Class Name text box. For more information on ActionScript classes, see "Creating Classes with ActionScript 2.0" in ActionScript Reference Guide Help.

To change the registration point of a screen:

1 Select a screen in the Screen Outline pane.

2 Select Window > Properties.

3 Click the Properties tab and click a point in the registration grid.

Clicking a registration point automatically selects Auto Snap on the Properties tab. When this option is selected, the registration point moves in relation to the screen content, but the screen itself does not move.

Setting parameters for a screen (Flash Professional only)

On the Parameters tab of the Property inspector, you can set parameters to control how the screen appears and behaves during playback. Different parameters are available for slide and form screens.

The following parameters are available only for slide screens:

- The parameter autoKeyNav determines whether the slide uses default keyboard handling to control navigation to the next or previous slide. When autoKeyNav is set to true, pressing the Right Arrow key or the Spacebar advances to the next slide, and pressing the Left Arrow key moves to the previous slide. When autoKeyNav is set to false, no default keyboard handling takes place. When autoKeyNav is set to inherit (the default setting), the slide inherits its autoKeyNav setting from its parent. If the slide's parent is also set to inherit, then the parent's ancestors are examined until one is found with its autoKeyNav parameter set to true or false. If a slide is a root slide, setting autoKeyNav to inherit yields the same result as setting it to true.

  Note: This property can be set independently for each slide, and it affects keyboard handling when that slide has focus.

- The parameter overlayChildren specifies whether child screens overlay one another on the parent screen during playback. When overlayChildren is set to true, child screens overlay one another. For example, suppose you have two children, Child 1 and Child 2, which are bullet points on Parent. If the user clicks a Next button and displays Child 1, then clicks Next again and displays Child 2, Child 1 remains visible when Child 2 is displayed. When overlayChildren is set to false (the default setting), Child 1 is removed from the display when Child 2 appears. This parameter affects only the immediate children of a slide, and not nested descendants.

- The parameter playHidden specifies whether a slide continues to play if it is hidden after being shown. When playHidden is set to true (the default setting), the slide continues to play when the slide is hidden after being shown. When playHidden is set to false, the slide stops playing if it is hidden, and resumes playing at Frame 1 if it is shown again.

There is one parameter that is available only to form screens: the parameter visible indicates whether a screen is visible or hidden at runtime. When visible is set to true, the screen is visible at runtime. When visible is set to false, the screen is hidden. This property does not affect the visibility of the screen in the authoring environment.

The following parameters are available for both slide screens and form screens:

- The parameter autoload indicates whether the content should load automatically (true), or wait to load until the Loader.load() method is called (false). The default value is true. This parameter is inherited from the Loader component.

- The parameter contentPath is an absolute or relative URL indicating the file to load when the loader.load() method is called. A relative path must point to the SWF file loading the content. The URL must be in the same subdomain as the URL where the Flash content currently resides. For use in Flash Player or with the Test Movie command, all SWF files must be stored in the same folder, and the filenames cannot include folder or disk drive specifications. The default value is undefined until the load starts. This parameter is inherited from the Loader component.

To specify parameter settings for a screen:

1 Select a screen in the Screen Outline pane.

2 Select Window > Properties.

3 In the Property inspector, click the Parameters tab.

4 Click the setting for a parameter and select a setting from the pop-up menu.

About adding media content to screens (Flash Professional only)

You add media content to screens just as you do to a Flash document that does not contain screens. You can add media content to the screen that is currently selected in the Screen Outline pane. For general information on adding media content to a Flash document, see "About adding media content" on page 13.

Selecting and moving screens (Flash Professional only)

When you select an individual screen in the Screen Outline pane, the screen is displayed in the Document window. You can select multiple contiguous or discontiguous screens in the Screen Outline pane, in order to apply modifications to several screens at once. When you select multiple screens, the contents of the first screen selected are displayed in the Screen Outline pane.

By default, the contents of a slide screen are not visible when you display the screen's parent in the Document window (the Hide Screen context menu option is selected). You can choose to show the contents of a slide screen when its parent is displayed by deselecting this option. When the Hide Screen context menu option is deselected, you can select the child slide screen on the Stage. This feature affects display during authoring only, not runtime playback. (The Hide Screen context menu option is deselected for form screens by default. You can turn the option on to hide child form screens in the display during authoring.)

You can cut, copy, paste, and drag screens in the Screen Outline pane to change their position in the document, and you can remove screens from a document.

Note: The terms *child*, *parent*, and *ancestor* refer to the hierarchical relationships of nested screens. See "Document structure and hierarchy (Flash Professional only)" on page 199.

To view a screen in the Document window, do one of the following:

• Click a screen thumbnail in the Screen Outline pane to view that screen.

• Select View > Go To and select the screen name from the submenu, or select First, Previous, Next, or Last to navigate through the screens.

• Click the Edit Screen button at the right side of the edit bar and select the screen name from the pop-up menu.

To select multiple screens in the Screen Outline pane, do one of the following:

• To select multiple contiguous screens, Shift-click the first and last screen you want to select.

• To select multiple discontiguous screens, Control-click (Windows) or Command-click (Macintosh) each screen.

To edit an item on a screen:

• Select the item in the Document window.

To view the contents of a child screen when the parent screen is displayed:

- Click Hide Screen in the child screen's context menu to turn off the Hide feature. (Hide Screen is selected for slide screens by default.)

To select a child screen on the Stage:

1. Make sure the Hide Screen context menu option is deselected. (See the previous procedure.)
2. Select the parent screen in the Screen Outline pane.
3. Click in the contents of the child screen on the Stage.

To edit an item on an ancestor screen of the current screen:

- Double-click the item in the Document window.

  The Smart Clicking feature displays the ancestor screen in the Document window and selects the item for editing.

  Note: By default, items on ancestor screens of the current screen are dimmed in the Document window.

To fully render all items on ancestor screens:

- Select View > Preview Mode > Full.

  For information on preview modes, see "Speeding up document display" on page 36.

To cut or copy a screen:

- Right-click (Windows) or Control-click (Macintosh) the screen and select Cut or Copy from the context menu.

To paste a screen:

- After cutting or copying the screen, right-click (Windows) or Control-click (Macintosh) another screen and select Paste from the context menu. The cut or copied screen is pasted after the selected screen.

  To nest the pasted screen within the selected screen, select Paste Nested Screen from the context menu.

To drag a screen in the Screen Outline pane:

- Using the mouse, drag the screen to any other position in the Screen Outline pane. Release the mouse button when the screen is in the desired position. To nest the screen within another screen, drag it toward the right side of the Screen Outline pane below the parent.

To remove a screen, do one of the following:

- Right-click (Windows) or Control-click (Macintosh) the screen and select Cut or Delete from the context menu.
- Select the screen and click the Delete Screen (-) button at the top of the Screen Outline pane.
- Press Backspace (Windows) or Delete (Macintosh).

Creating controls and transitions for screens with behaviors (Flash Professional only)

You can create controls and transitions for screens using behaviors. Controls enable the flow between screens—for example, you can go to another screen, hide a screen, or show a screen. Transitions create visual animations that play as the Flash document display changes from one screen to another.

Behaviors are built-in ActionScript scripts that you add to an object, such as a screen, to control that object. Behaviors enable you to add the power, control, and flexibility of ActionScript coding to your document without having to create the ActionScript code yourself. Behaviors are available for a variety of objects in Flash, including movie clips, text fields, and video and sound files.

Adding controls to screens using behaviors (Flash Professional only)

To add a control to a screen using a behavior, you attach the behavior to a trigger—a button, movie clip, or screen—and target the screen that you want to be affected by the behavior. You can select the event that triggers the behavior.

You can add the following behaviors to control slide screens: Go to First Slide, Go to Last Slide, Go to Next Slide, Go to Previous Slide, and Go to Slide (specify slide name).

Note: Go to Next Slide and Go to Previous Slide navigate to screens on the same level, not to parents or children. For an explanation of parents and children, see "Document structure and hierarchy (Flash Professional only)" on page 199.

You can add the following behaviors to control slide or form screens: Show a Specified Screen (if the screen has previously been hidden), Hide a Specified Screen (if the screen has previously been shown).

To add a control behavior:

1 Select the button, movie clip, or screen that will trigger the behavior.

2 In the Behaviors panel, click the Add (+) button.

3 Select Screen, and select the desired control behavior from the submenu.

4 If the behavior requires that you select a target screen, the Select Screen dialog box appears. Select the target screen in the tree control. Click Relative to use a relative target path, or Absolute to use an absolute target path, and click OK. (For information on target paths, see "Using absolute and relative target paths" on page 20.)

   Note: Some behaviors select a target screen by default; for example, the Go to First Slide screen automatically targets the first screen. Such behaviors do not display the Select Screen dialog box.

5 In the Event column, click in the row for the new behavior and select an event from the list. This specifies what event will trigger the behavior—for example, a user clicking a button, a movie clip loading, or a screen receiving focus. The list of available events depends on the type of object you are using to trigger the behavior.

Adding transitions to screens using behaviors (Flash Professional only)

Screen transition behaviors allow you to add animated transitions between screens, fade a screen in or out, rotate a screen as it appears or disappears, have a screen fly in from the edge of a document, and create other effects. To add a transition using a behavior, you attach the behavior directly to a screen.

You can choose the direction of a transition: In, to play the animation as the screen first appears in the document, or Out, to play the animation as the screen disappears from the document. You can also choose the duration in seconds.

Easing options let you modify the transition to achieve different effects. For example, the Bounce easing option makes the screen appear to bounce as the transition completes.

Some transitions have additional parameters that you can modify. Parameters appear in the Transitions dialog box when you select the transition.

Follow these guidelines when adding transitions:

- For most situations, the In option is recommended.
- Use the In option when applying a transition the on(reveal) event.
- Use the Out option when applying a transition that uses the on(hide) event.
- Do not add an Out transition immediately before an In transition in a presentation.
- To attach the same transition to all children of a given slide, attach the single transition to the on(revealChild) or on(hideChild) event of the parent, rather than duplicating the transition on all child slides.

To add a transition behavior:

1 Select the screen to which you want to apply the behavior.

2 In the Behaviors panel, click the Add (+) button.

3 Select Screen > Transition from the submenu.

4 In the Transition dialog box, select a transition from the scroll list.

   A animated preview of the transition plays in the preview window, and a brief description of the transition appears in the description field. The animation changes to reflect options that you choose for the transition in the following steps.

5 For Direction, select In to play the transition as the screen appears in the document, and Out to play the transition as the screen disappears from the document.

6 For Duration, enter a time in seconds.

7 For Easing, select an option to define the transition style.

8 If the transition has additional parameters, select options or enter values for those parameters in the fields provided.

9 Click OK.

10 In the Behaviors panel, go to the Event column and click in the row for the new behavior, then select an event from the list. This specifies which event will trigger the behavior—for example, the mouse pointer moving over the screen.

Using Find and Replace with screens (Flash Professional only)

You can use the Find and Replace feature to find and replace a specified element in a Flash document that uses screens. You can search for a text string, font, color, symbol, sound file, video file, or imported bitmap file.

You can search for elements in the entire document or in the current screen.

To use Find and Replace with a document containing screens:

1 Choose Edit > Find and Replace.

2 Do one of the following:

- To search the entire document, select Current Document from the Search In pop-up menu.

- To search a screen, click in the Screen Outline pane and select Current Screen from the Search In pop-up menu.

  For instructions on searching for text, fonts, colors, and so on, see "Using Find and Replace" on page 26.

About using the Movie Explorer with screens (Flash Professional only)

You can use the Movie Explorer to view and organize the contents of a document containing screens. The Movie Explorer handles documents that contain screens much as it handles those that do not contain screens, with these exceptions:

- The Movie Explorer displays the contents of the current screen (the screen selected in the Screens Outline pane) only.

- You cannot view scenes in the Movie Explorer, because a document with screens cannot contain scenes.

For information on using the Movie Explorer, see "Using the Movie Explorer" on page 24.

About using Timelines with screens (Flash Professional only)

Each screen has its own Timeline. The Timeline is collapsed by default. You must expand it to work with frames or layers.

You cannot view or modify the main Timeline of a screen-based document.

You can add frames, keyframes, and layers, and manipulate content on a screen's Timeline.

In the Timeline, nested screens work much as nested movie clips do, with some exceptions. See "How screens interact with ActionScript (Flash Professional only)" on page 213.

About using ActionScript with screens (Flash Professional only)

You can use ActionScript to control screens in a document. You can insert, remove, rename, or change the order of screens, and perform other operations.

ActionScript uses the screen instance name, class name, and registration point when controlling screens. See "Screen instance names, class names, and registration points (Flash Professional only)" on page 212. ActionScript also uses the screen parameters. See "Setting parameters for a screen (Flash Professional only)" on page 206.

Screens and movie clips interact with ActionScript in similar ways, with some important differences. See "How screens interact with ActionScript (Flash Professional only)" on page 213.

For more information on controlling screens with ActionScript, see "Screen class," "Form class," and "Slide class" in Using Components Help.

Screen instance names, class names, and registration points (Flash Professional only)

The screen name is used to automatically generate the instance name and class name of the screen. These identifying labels are needed when you manipulate screens with ActionScript in various ways. You can change a screen's registration point to adjust how the screen behaves. You can work with these features in various ways:

- The instance name is a unique name assigned to a screen, used when you target the screen in ActionScript. You can change the instance name in the Property inspector. The instance name is identical to the screen name in the Screen Outline pane and the linkage identifier for the screen. If you update the instance name, the screen name and the linkage identifier are also updated. See "Setting properties and parameters for a screen (Flash Professional only)" on page 204.

  Note: Symbol instances, including movie clips, buttons, and graphics, also have instance names. For more information on symbol instances, see Chapter 3, "Using Symbols, Instances, and Library Assets," on page 47.

- The class name identifies the ActionScript class to which the screen is assigned. By default, a slide screen is assigned to the mx.screens.Slide class, and a form screen is assigned to the mx.screens.Form class. You can assign the screen to a different class to modify the methods and properties available for the screen. For more information on ActionScript classes, see "Creating Classes with ActionScript 2.0" in ActionScript Reference Guide Help.

- The Property inspector indicates the registration point in the x and y coordinate fields and in the registration point grid. See "Setting properties and parameters for a screen (Flash Professional only)" on page 204. You may want to move the registration point for greater control in manipulating screen content. For example, if you want to create a spinning shape in the center of a screen, you can reposition the screen registration point at the center of the screen and rotate the screen around its registration point.

How screens interact with ActionScript (Flash Professional only)

Screens are similar to nested movie clips in the way that they interact with ActionScript. (See "Nested movie clips" on page 19.) However, there are some differences.

Keep these guidelines in mind when you use ActionScript with screens:

* When you select a screen in the Screen Outline pane and add ActionScript, the script is added directly to the screen as an object action (much as ActionScript is added directly to a movie clip). It's usually best to use object actions for simple code (such as creating navigation between screens) and external AS files for more complex code.

* For best results, organize the document structure and finalize screen names before adding ActionScript. If you rename a screen, the instance name is automatically changed, and you must update the instance names in any ActionScript code you have already written.

* If you want to add a frame action to the Timeline for a screen, you must select the screen, expand the Timeline (collapsed by default), then select the first frame in the Timeline. However, it's usually best to use an external AS file, rather than a frame action, for complex code on a screen.

* You cannot view or manipulate the main Timeline for a screen-based document. However, you can target the main Timeline using _root in a target path.

* Each screen is automatically associated with ActionScript, based on its class. (See "Slide screens and form screens (Flash Professional only)" on page 200.) You can change the class that a screen is assigned to, and you can set some parameters for a screen in the Property inspector. See "Setting properties and parameters for a screen (Flash Professional only)" on page 204.

* Use the Screen class, Slide class, and Form class to control screens with ActionScript.

* Use components whenever possible to create interactivity. Put no more than 125 total component instances in a single FLA file.

* To create navigation between slides, use rootSlide. For example, to get the current slide, use rootSlide.currentSlide.

* Do not try to do slide navigation inside of on(reveal) or on(hide) handlers.

* Do not add an on(keydown) or on(keyup) event to ActionScript code controlling a screen.

For more information on controlling screens with ActionScript, see "Screen class," "Form class," and "Slide class" in Using Components Help.

About using components with screens (Flash Professional only)

You can use components with screens to create complex, structured applications in Flash. Components are especially useful in conjunction with forms, to create structured applications that display data and enable nonlinear user interactivity. For example, you can use forms to populate a container component.

When you use components with screens, you can use the Focus Manager to create custom navigation between components. The Focus Manager specifies the order in which components receive focus when a user presses the Tab key to navigate in an application. For example, you can customize a form application so that a user can press Tab to navigate fields and press Return (Macintosh) or Enter (Windows) to submit the form.

For information on the Focus Manager, see "Creating custom focus navigation" and "FocusManager" in Using Components Help.

You can also create a tab order using the Accessibility panel. See "Viewing and creating tab order and reading order" on page 330.

Accessibility in the Flash screens authoring environment (Flash Professional only)

Accessibility support is available for screen-based documents in the Flash authoring environment. Using keyboard shortcuts rather than the mouse, users can navigate a document and use interface elements, including screens, panels, the Property inspector, dialog boxes, the Stage, and objects on the Stage.

Accessibility support for screen-based documents is similar to support for other documents, with one exception: when keyboard shortcuts are used to navigate panels (Control+Alt+Tab in Windows or Command+Option+Tab on the Macintosh), the Screen Outline pane receives focus the first time the keyboard shortcut is used. (For other documents, the Timeline receives focus first.)

To cycle through individual screens in the Screen Outline pane, you use the arrow keys.

The Screen Outline pane receives focus only the first time you cycle through the panels. That is, if you come to the last panel and press the keyboard shortcut again, the Screen Outline pane is skipped, and the next panel receives focus.

For complete information on accessibility in the Flash authoring environment, see Chapter 17, "Creating Accessible Content," on page 319.

CHAPTER 13
Creating Multilanguage Text

As more applications are distributed to worldwide audiences, it is becoming common to author applications that can be displayed in multiple languages. Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 provide several new features that greatly enhance the work flow for authoring multiple language Unicode-based applications. You can include multilanguage text in your document in various ways:

- The new Strings panel allows localizers to edit strings in a central location inside Flash, or in external XML files with their preferred software or translation memory. See "Authoring multilanguage text with the Strings panel" on page 221.

- You can select which character sets you want to embed in your applications, thus limiting the number of character glyphs in your published SWF file and reducing its size. See "Using embedded fonts" on page 218.

- You can use a western-style keyboard to create text on the Stage in Chinese, Japanese, and Korean. See "Using a Western keyboard to enter Asian characters on the Stage" on page 228.

- If you have Unicode fonts installed on your system, you can enter text directly into a text field. Because the fonts are not embedded, your users must have Unicode fonts as well. See "Creating documents with multilanguage text without using the Strings panel" on page 227.

Other, less common, methods of including multilingual text in your movie include the following:

- You can include an external text file in a dynamic or input text field, using the #include action. See "Creating documents with multilanguage text using the #include action" on page 229.

- You can load external text or XML files into a Flash application at runtime using the loadVariables action, the getURL action, the LoadVars object, or the XML object. See "Using ActionScript to load external files" on page 228.

- You can enter Unicode escape characters in the string value for a dynamic or input text field variable. See "Creating documents with multilanguage text using text variables" on page 230.

As is true for all text, for Unicode-encoded text to be displayed correctly, users must have access to fonts containing the glyphs (characters) used in that text. See "Using external text or XML files that are not Unicode encoded" on page 230.

Selecting an encoding language

All text in a computer is encoded as a series of bytes. Many different forms of encoding (and therefore different bytes) represent text. Different kinds of operating systems use different kinds of encoding for text. For example, Western Windows operating systems usually use CP1252 encoding; Western Macintosh operating systems usually use MacRoman encoding; Japanese Windows and Macintosh systems usually use Unicode encoding.

Unicode can encode most languages and characters used throughout the world. The other forms of text encoding used by computers are subsets of the Unicode format, tailored to specific regions of the world. Some of these forms are compatible in some ranges and incompatible in other ranges, so using the correct encoding is critical.

Unicode comes in several forms. Flash Player versions 6 and 7 support text or external files in the 8-bit Unicode format UTF-8, and in the 16-bit Unicode formats UTF-16 BE (Big Endian) and UTF-16 LE (Little Endian). See "Text encoding in Flash Player 7" on page 216.

Unicode and Macromedia Flash Player

Macromedia Flash Player 6 and later supports Unicode text encoding. Any user with Flash Player 6 or later can view multilanguage text, regardless of the language used by the operating system running the player, if they have the correct fonts installed.

Flash Player 6 and later assumes that all external text files associated with a Flash Player application are Unicode encoded, unless you tell the player otherwise. If you use external text files that are not Unicode encoded, you can set the system.useCodepage property to true to tell Flash Player to use the traditional code page of the operating system running the player. See "Using external text or XML files that are not Unicode encoded" on page 230.

For Flash applications in Macromedia Flash Player 5 or earlier that are authored in Flash MX or earlier, Flash Player 6 and earlier versions display the text using the traditional code page of the operating system running the player.

For background information on Unicode, see www.Unicode.org.

Text encoding in Flash Player 7

By default, Flash Player 7 assumes that all text it encounters is Unicode encoded. If your document loads external text or XML files, the text in these files should be UTF-8 encoded. You can create these files using the Strings panel, or in a text or HTML editor, such as Macromedia Dreamweaver MX 2004, that can save the files in Unicode format.

Flash Player 7 supports the 8-bit Unicode format UTF-8, and the 16-bit Unicode formats UTF-16 BE (Big Endian) and UTF-16 LE (Little Endian). See "Unicode encoding formats supported by Flash Player" on page 217.

Unicode encoding formats supported by Flash Player

When reading text data in Flash, Flash Player looks at the first two bytes in the file to detect a byte order mark (BOM), a standard formatting convention used to identify the Unicode encoding format. If no BOM is detected, the text encoding is interpreted as UTF-8 (an 8-bit encoding format). It is recommended that you use UTF-8 encoding in your applications.

If Flash Player detects either of the following BOMs, the text encoding format is interpreted as follows:

- If the first byte of the file is OxFE and the second is OxFF, the encoding is interpreted as UTF-16 BE (Big Endian). This is used for Macintosh operating systems.
- If the first byte of the file is OxFF and the second is OxFE, the encoding is interpreted as UTF-16 LE (Little Endian). This is used for Windows operating systems.

Most text editors that can save files in UTF-16BE or LE automatically add the BOMs to the files.

Note: If you set the system.useCodepage properly to true, the text is interpreted using the traditional code page of the operating system that is running the player; it is not interpreted as Unicode. See "Using external text or XML files that are not Unicode encoded" on page 230.

About encoding in external XML files

You cannot change the encoding of an XML file by changing the encoding tag. Flash Player identifies the encoding of an external XML file using the same rules as for all external files: If no byte order mark is encountered at the beginning of the file, the file is assumed to be in UTF-8 encoding. If a byte order mark is encountered, the file is interpreted as UTF-16BE or LE. See "Unicode encoding formats supported by Flash Player" on page 217.

Fonts for Unicode-encoded text

When you use external files that are Unicode encoded, your users must have access to fonts containing all the glyphs used in your text files. By default, Flash MX 2004 stores the names of fonts used in dynamic or input text files. During SWF file playback, Flash Player 7 (and earlier versions) looks for those fonts on the operating system running the player.

If the text in a SWF file contains glyphs that are not supported by the specified font, Flash Player 7 attempts to locate a font on the user's system that does support those glyphs. It is not always possible for the player to locate an appropriate font. The behavior of this function depends on the fonts available on the user's system, as well as on the operating system running Flash Player.

Using embedded fonts

You can embed fonts for dynamic or input text fields. However, some fonts, particularly those used for Asian languages, can add significantly to the SWF file size when embedded. With Flash MX 2004 and Flash MX Professional 2004, you can select ranges of fonts you want to embed.

To select and embed a range of fonts:

1   On the Stage, select a text field. Then display the Property inspector (Window > Properties).

2   Click the Character button to display the Character Options dialog box.

3   Select one of the following options:

    No Characters   Select this option if you do not want to embed any characters, but rather the use the font specified during authoring or provide appropriate font substitution when using device fonts.

    Specify Ranges   Select this option to select a range of characters to embed into the SWF file. By choosing only the characters you want to embed, you can create a smaller and more efficient SWF file.

4   If you have selected Specify ranges, select the ranges of font sets you want to embed by doing the following:

    ■   Click on a font set in the pop-up menu.

    ■   Select multiple ranges by Shift-clicking the first and last fonts of a contiguous range of fonts, or by Control-clicking (Windows) or Command-clicking (Macintosh) to select noncontiguous fonts.

    The size of each font group is displayed in parentheses next to the font name. As you select multiple font sets, the panel displays the total number of glyphs you have selected.

    Note: For example, to embed both Chinese characters and western characters, you would need to select both Chinese and western font sets. Select only the font sets you want to embed, however, so you do not exceed the internal maximum number of glyphs for the authoring tool (approximately 30,000). If you select more than the maximum, a warning dialog box appears.

5   Click OK. If you exceed the internal maximum number of glyphs for the authoring tool a warning dialog box appears.

    Note: Flash does not perform error-checking to confirm that glyphs actually exist in the font for the selected character set. During the actual publish or export procedure, only glyphs that are present in the font are embedded in the SWF file.

To embed font sets from text on the Stage:

1   Select the text on the Stage.

2   In the Property inspector (Window > Properties), click the Character button to display the Character Options dialog box.

3   If necessary, select Specify Ranges.

4   Click the AutoFill button.

5   Click OK.

    The font glyphs for the selected fonts are embedded.

XML font embedding table

The list of selected fonts is stored and maintained as an external XML file and resides in the user configuration folder. It is named Unicode_Table.xml and contains the one-to-many relationship between a particular language and all the necessary Unicode glyph ranges as illustrated in the following Korean examples.

The font set groupings are based upon the Unicode Blocks as defined by the Unicode Consortium. They are organized in Flash in a manner that makes selection quick and easy. To provide a simpler workflow, when you select a particular language, all related glyph ranges are embedded even if they are scattered into disjointed groupings.

For example, if you select Korean, the following Unicode character ranges are embedded.

3131-318E Hangul symbols

3200-321C Hangul specials

3260-327B Hangul specials

327F-327F Korean symbol

AC00-D7A3 Hangul symbols

If you select Korean + CJK, then a larger font set is embedded:

3131-318E Hangul symbols

3200-321C Hangul specials

3260-327B Hangul specials

327F-327F Korean symbol

4E00-9FA5 CJK symbols

AC00-D7A3 Hangul symbols

F900-FA2D CJK symbols

Font set selections

The following table gives more details about each font set selection.

Range	Description
Uppercase [A–Z]	Basic Latin uppercase glyphs
Lowercase [a–z]	Basic Latin lowercase glyphs
Numerals [0–9	Basic Latin numeral glyphs
Punctuation [!@#%...]	Basic Latin punctuation
Basic Latin	Basic Latin glyphs within the Unicode range 0x0021 to 0x007E
Japanese Kana	Hiragana and Katakana glyphs (including half-width forms)
Japanese Kanji - Level 1	Japanese Kanji characters
Japanese (All)	Japanese Kana and Kanji (including punctuation and special characters)

Range	Description
Basic Hangul	Most commonly used Korean characters, roman characters, punctuations, and special characters/symbols
Hangul (All)	11,720 Korean characters (sorted by Hangul syllables), Roman characters, punctuations, and special characters/symbols)
Simplified Chinese - Level 1	5000 most commonly used Traditional Chinese characters used in Taiwan
Traditional Chinese (All)	All Traditional Chinese characters used in Taiwan and Hong Kong, and punctuations
Simplified Chinese - Level 1	6000 most commonly used Simplified Chinese characters used in Mainland of China and punctuations
Chinese (All)	All Traditional and Simplified Chinese characters and punctuations
Thai	All Thai glyphs
Devanagari	All Devanagari glyphs
Latin I	Latin-1 Supplement range 0x00A1 to 0x00FF (including punctuation, superscripts and subscripts, currency symbols, and letter-like symbols)
Latin Extended A	Latin Extended-A range 0x0100 to 0x01FF (including punctuation, superscripts and subscripts, currency symbols, and letter-like symbols)
Latin Extended B	Latin Extended-B range 0x0180 to 0x024F (including punctuation, superscripts and subscripts, currency symbols, and letter-like symbols)
Latin Extended Add'l	Latin Extended Additional range 0x1E00 to 0x1EFF (including punctuation, superscripts and subscripts, currency symbols, and letterlike symbols)
Greek	Greek and Coptic, plus Greek Extended (including punctuation, superscripts and subscripts, currency symbols, and letterlike symbols)
Cyrillic	Cyrillic (including punctuation, superscripts and subscripts, currency symbols, and letterlike symbols)
Armenian	Armenian plus ligatures
Arabic	Arabic plus Presentation Forms-A and Presentation Forms-B
Hebrew	Hebrew plus Presentation Forms (including punctuation, superscripts and subscripts, currency symbols, and letterlike symbols)

Authoring multilanguage text with the Strings panel

The new Strings panel provides a simplified workflow for authoring multilanguage text. The general workflow steps are as follows.

* Author a FLA file in one language. Any text that you want to enter in another language must be in a dynamic or input text field.

* In the Strings panel Settings dialog box, select the languages you want to include and select one of them as the default language.

* After you select a language, a column for the language is added to the Strings panel. When you save, test, or publish the application, a folder with an XML file is created for each language. See "Selecting languages for translation" on page 221.

* In the Strings panel, encode each text string with an ID. See "Adding strings to the Strings panel" on page 222.

* Publish the application.

* A folder is created for each language you selected, and within each language folder is an XML file for that language. See "Publishing and deploying multilanguage text" on page 224.

* Send the published FLA file and XML folders and files to your translators. You can author in your native language, then leave the translating up to them. They can use translation software directly in the XML files or in the FLA file. "Translating text in the Strings panel or an XML file" on page 226.

* When you receive the translations from your translators, import the translated XML files back into the FLA file. See "Importing an XML file into the Strings panel" on page 227.

For a sample of a multilanguage document, see "Developing multilingual content" on page 383.

Selecting languages for translation

You can select up to 100 different languages that can be displayed on the Stage and in the Strings panel for translation. Each language you select becomes a column in the Strings panel. You can change the Stage language to display the text on the Stage in any of the languages you selected. The selected language is displayed when you publish or test the file.

When selecting languages, you can use any of the languages provided in the pop-up menu, as well as any other Unicode-supported language.

To select a language:

1 Select Window > Other Panels > Strings to open the Strings panel.

2 Click the Settings button to display the Settings dialog box.

3 Add a language by doing one of the following:

   ■ In the Languages pop-up menu, highlight a language you want to select, then click the Add button.

   ■ If the language does not appear in the pop-up menu, in the blank field below the Select languages pop-up menu, type a language code and optional country code, in the format xx_XX. Then click the Add button. The first part, xx, is the language code from ISO 639-1, and XX is the optional uppercase two-letter country code from ISO 3166-1.

   After you click the Add button, the language is displayed in the Available Languages field.

4 Repeat step 3 until you have added all the languages you want to add.

5 In the Default language field, select a default language. This language is displayed on systems that do not have one of the available languages you selected.

6 If you want to load an XML file for the languages from a different URL at runtime, type the URL in the URL text box.

   Note: The XML file generated by Flash is always stored in a folder for the language within the folder for the FLA file.

7 Click OK.

   A column for each selected language is displayed in the Strings panel. The columns are displayed in alphabetical order.

8 Save the FLA file. When you save the FLA file, a folder for each language you selected is created in the same folder the FLA file resides in. Within each language file an XML file is created that is used to load translated text.

To remove a language:

1 Select Window > Other Panels > Strings to open the Strings panel.

2 Click the Settings button to display the Settings dialog box.

3 In the Available Languages field, highlight a language you want to remove, then click the Remove button.

   The language is no longer displayed in the Available Languages field.

4 Repeat step 3 until all the languages you want to remove are removed.

5 When you are done removing languages, click OK.

   The column for each removed language is no longer displayed in the Strings panel.

Adding strings to the Strings panel

There are several ways to assign text strings to the Strings panel: you can assign a string ID to a dynamic or input text field, add a string to the Strings panel without assigning it to a text field, or assign an existing string ID to an existing dynamic or input text field. For information about creating dynamic and input text fields, see "Creating text" on page 97.

To assign a string ID to a text field:

1 Select Window > Other Panels > Strings to open the Strings panel.

2 Select the Text tool from the toolbar. On the Stage, create an input or dynamic text field.

3 While the text field is selected, enter a unique ID in the ID field in the Strings panel.

   Note: If a static text box is selected on the Stage, the Stage text selection section on the Strings panel displays the message "Current text cannot have an ID associated with it." If a nontext item is selected or multiple items are selected, it displays the message "Current selection cannot have an ID associated with it."

4 In the Strings panel, type the string in the String text box.

5 Click Apply to add the string to the Strings panel.

   Note: You can also use the Enter key to apply the ID to the text field.

To add a string ID to the Strings panel without assigning it to a text field:

1 Select Window > Other Panels > Strings to open the Strings panel.

2 Type in a new string ID and new string in the Strings panel, then click the Apply button.

Note: You can also use the Enter key to apply the ID to the text field.

3 When you are ready to assign the new string to a text field, follow the steps in the following procedure.

To assign an existing ID to a text field:

1 Select the Text tool from the toolbar. On the Stage, create an input or dynamic text field.

2 Type the name of an existing ID in the ID section of the Strings panel.

3 Click Apply.

The String text field on the Stage is displayed with the text string assigned to the ID.

Note: You can also use the Enter key to apply the ID to the text field.

Changing the language displayed on the Stage

You can change the language displayed on the Stage to any of the available languages you previously selected. See "Selecting languages for translation" on page 221.

To display the text on the Stage in another language:

1 Select Window > Other Panels > Strings to open the Strings panel.

2 In the Stage Language pop-up menu, select the language you want to use for the Stage language. This must be a language you previously added as an available language.

After you change the Stage language any new text you type on the Stage is displayed in that language. If you have previously entered text strings for the language in the Strings panel, any text on the Stage is displayed in the selected language. If not, the text fields already on the Stage are blank.

About editing text in the Strings panel

After you have entered text in the Strings panel, you can edit the text in several ways:

- You can edit the text directly in the Strings panel cells.

- You can edit the text on the Stage in the language selected as the Stage language, using language-editing features such as find and replace (see "Finding and replacing text" on page 26) and spell checking (see "Using the Check Spelling feature" on page 108). Text that is changed using these features is changed on the Stage and in the Strings panel.

- You can edit the XML file directly. See "Translating text in the Strings panel or an XML file" on page 226.

Publishing and deploying multilanguage text

When you save, publish, or test the FLA file, a folder with an XML file is created for each available language you selected in the Strings panel. The default location for the XML folders and files is the same as the location of the FLA file. For example, if you have a file named Test in the mystuff directory, and you have selected English (en), German (de), and Spanish (es) as available languages, when you save the FLA file, the following folder structure is created:

```
\mystuff\Test.fla
\mystuff\de\Test_de.xml
\mystuff\en\Test_en.xml
\mystuff\es\Test_es.xml
```

When you deploy a SWF file, you also need to deploy the associated XML files with the string translations in the web server. The first frame that contains text cannot be displayed until the entire XML file is downloaded.

Automatic language detection and the default language

You can change the default language to any language that you have selected as an available language. When automatic language detection is turned on, and the SWF file is viewed on the language operating system platform, the default language is displayed on any systems that are set to a default language other than those languages you selected. For example, if you have set your default language to English, and if you have selected JP, EN, and FR as available languages, users who have their system language set to Japanese, English, or French automatically see text strings displayed in their language. However, users who have their system language set to Swedish, which is not one of the languages you selected, automatically see text strings displayed in the default language you selected—in this case, English.

When you publish a Flash application (select File > Publish), however, the default language setting specified in the Strings panel Settings dialogue box is published in the resulting SWF file. For example, if the default language set in the Strings panel Settings dialogue box is French, but the operating system and Flash are in English, the published movie SWF file is in the default language, in this case French.

Note: When you test a Flash application (select Control > Test Movie), the Stage language setting specified in the Strings panel is published in the resulting SWF file. For example, if the Stage language set in the Strings panel Settings dialogue box is English, and the default language is French, the test SWF file is in the Stage language, in this case English.

To select the default language and automatic language detection:

1   Select Window > Other Panels > Strings to open the Strings panel.

2   Click the Settings button to display the Settings dialog box.

3   In the Default language pop-up menu, select the language you want to use for the default language. This must be a language you previously added as an available language.

4   If you want to enable automatic language detection, make sure that Insert ActionScript for Automatic Language Detection is selected.

5   Click OK.

XML file format

Exported XML is in UTF-8 format and follows the XML Localization Interchange File Format (XLIFF)1.0 standard. It is used to define a specification for an extensible localization interchange format that will allow any software provider to produce a single interchange format that can be delivered to and understood by any localization service provider. For more information about XLIFF, see www.oasis-open.org/committees/xliff/.

XLIFF examples

If any of the following characters are entered in the Strings panel, they are replaced by the appropriate entity reference when written out to XML files:

Character	Replaced by
&	&
'	'
"	"
<	<
>	>

Exported XML file sample

The following samples show what an XML file generated by the Strings panel looks like in the source language—in this example, English—and in another language—in this example, French.

English source version sample

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE xliff PUBLIC "-//XLIFF//DTD XLIFF//EN"
"http://www.oasis-open.org/committees/xliff/documents/xliff.dtd" >
<xliff version="1.0" xml:lang="en">
<file datatype="plaintext" original="MultilingualContent.fla" source-
    language="EN">
    <header></header>
    <body>
        <trans-unit id="001" resname="IDS_GREETINGS">
            <source>welcome to our web site!</source>
        </trans-unit>
        <trans-unit id="002" resname="IDS_MAILING_LIST">
            <source>Would you like to be on our mailing list?</source>
        </trans-unit>
        <trans-unit id="003" resname="IDS_SEE_YOU">
            <source>see you soon!</source>
        </trans-unit>
        <trans-unit id="004" resname="IDS_TEST">
            <source></source>
        </trans-unit>
    </body>
</file>
</xliff>
```

French version sample

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE xliff PUBLIC "-//XLIFF//DTD XLIFF//EN"
"http://www.oasis-open.org/committees/xliff/documents/xliff.dtd" >
<xliff version="1.0" xml:lang="fr">
<file datatype="plaintext" original="MultiLingualContent.fla" source-
    language="EN">
    <header></header>
    <body>
        <trans-unit id="001" resname="IDS_GREETINGS">
            <source>Bienvenue sur notre site web!</source>
        </trans-unit>
        <trans-unit id="002" resname="IDS_MAILING LIST">
            <source>Voudriez-vous être sur notre liste de diffusion?</source>
        </trans-unit>
        <trans-unit id="003" resname="IDS_SEE YOU">
            <source>A bientôt!</source>
        </trans-unit>
        <trans-unit id="004" resname="IDS_TEST">
            <source></source>
        </trans-unit>
    </body>
</file>
</xliff>
```

Translating text in the Strings panel or an XML file

After you have finished authoring your document, assigned IDs to all the text in the Strings panel, and selected all the languages you want to translate the document into, you can send it to translators. When sending files to translators, you need to include not only the FLA file but also the folders for the XML files and the XML file for each language.

Translators can either work directly in the language columns in the Strings panel or work in the XML files for each language to translate the FLA file to selected languages. If you translate directly in the XML file, you must either import the XML file to the Strings panel or save it in the default directory for that language. See "Importing an XML file into the Strings panel" on page 227.

To translate text in the Strings panel:

1 Select Window > Other Panels > Strings to open the Strings panel.

2 For each language to be translated, select the appropriate language column, then type the translated text for that language to be associated with each string ID.

3 To display the text on the Stage in the language you selected, select the language in the Stage Language field.

4 When you are finished, save, publish, or test the file.

    All XML files for all languages are overwritten with the information in the Strings panel.

    Note: If you want to preserve the translation in an XML file, save it in a different folder.

To translate text in an XML file:

1   Using an XML file editor or translating software, open the folder for the desired language, then the XML file for that language. The XML file is populated with the IDs for each text string.

2   Enter the text string for the language next to the ID. See "English source version sample" on page 225 and "French version sample" on page 226.

3   If necessary, import the translated XML file into the Strings panel. See the following section.

Importing an XML file into the Strings panel

After you modify an XML file, if you place it in the directory or folder specified in the Strings panel for that language, the XML file is loaded into the FLA file when it is opened.

You can also import an XML file into the Strings panel from another location. After you import it, when you save, test, or publish the file, the XML file in the folder specified for that language is overwritten. You cannot import an XML file for a language unless it has already been selected as an available language in the Strings panel. You can also add a language and import an XML file with the translation for that language.

To import an XML file into the Strings panel:

1   Select Window > Other Panels > Strings to open the Strings panel.

2   Click Import XML to display the Import XML dialog box.

3   In the Select a Language pop-up menu, select the language of the XML file you are importing, then click OK.

4   Navigate to the folder and XML file to import.

The XML information is loaded into the column in the Strings panel for the language you selected in step 3.

Note: Be sure to select the same language in Steps 3 and 4. Otherwise, you could, for example, import a French XML file into the column for German.

Regardless of where the XML file you imported was located, when you save, test, or publish the Flash document (FLA), a folder for each language in the Strings panel and an XML file for each language are created in the same folder the FLA file is located in. The XML files generated by the Strings panel are always populated with the information in the Strings panel.

Creating documents with multilanguage text without using the Strings panel

You can create documents with multilanguage text without using the Strings panel. See the following sections:

"Using the XMLConnector component to connect to external XML files" on page 228

"Using a Western keyboard to enter Asian characters on the Stage" on page 228

"Using ActionScript to load external files" on page 228

"Creating documents with multilanguage text using the #include action" on page 229

"Creating documents with multilanguage text using text variables" on page 230